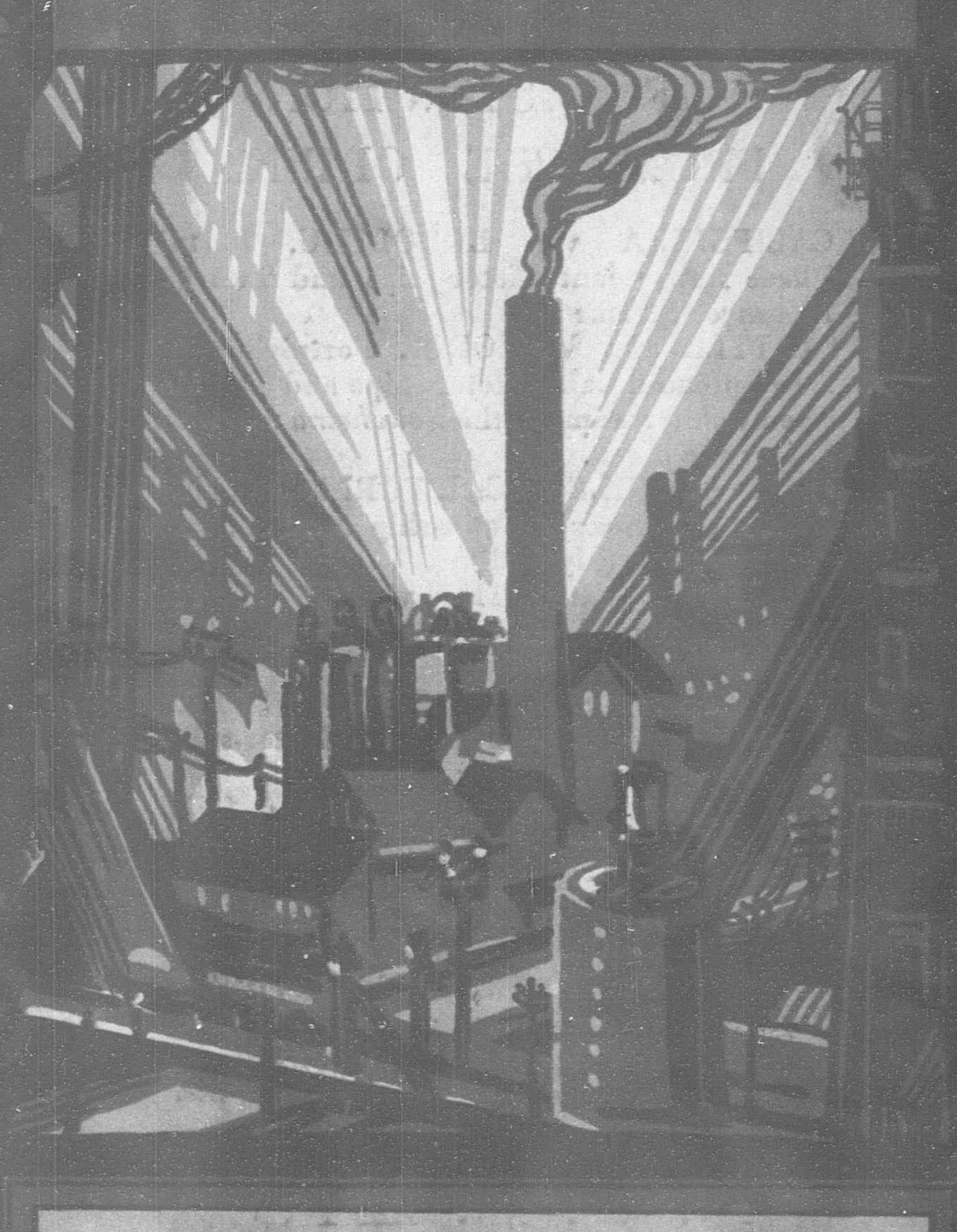
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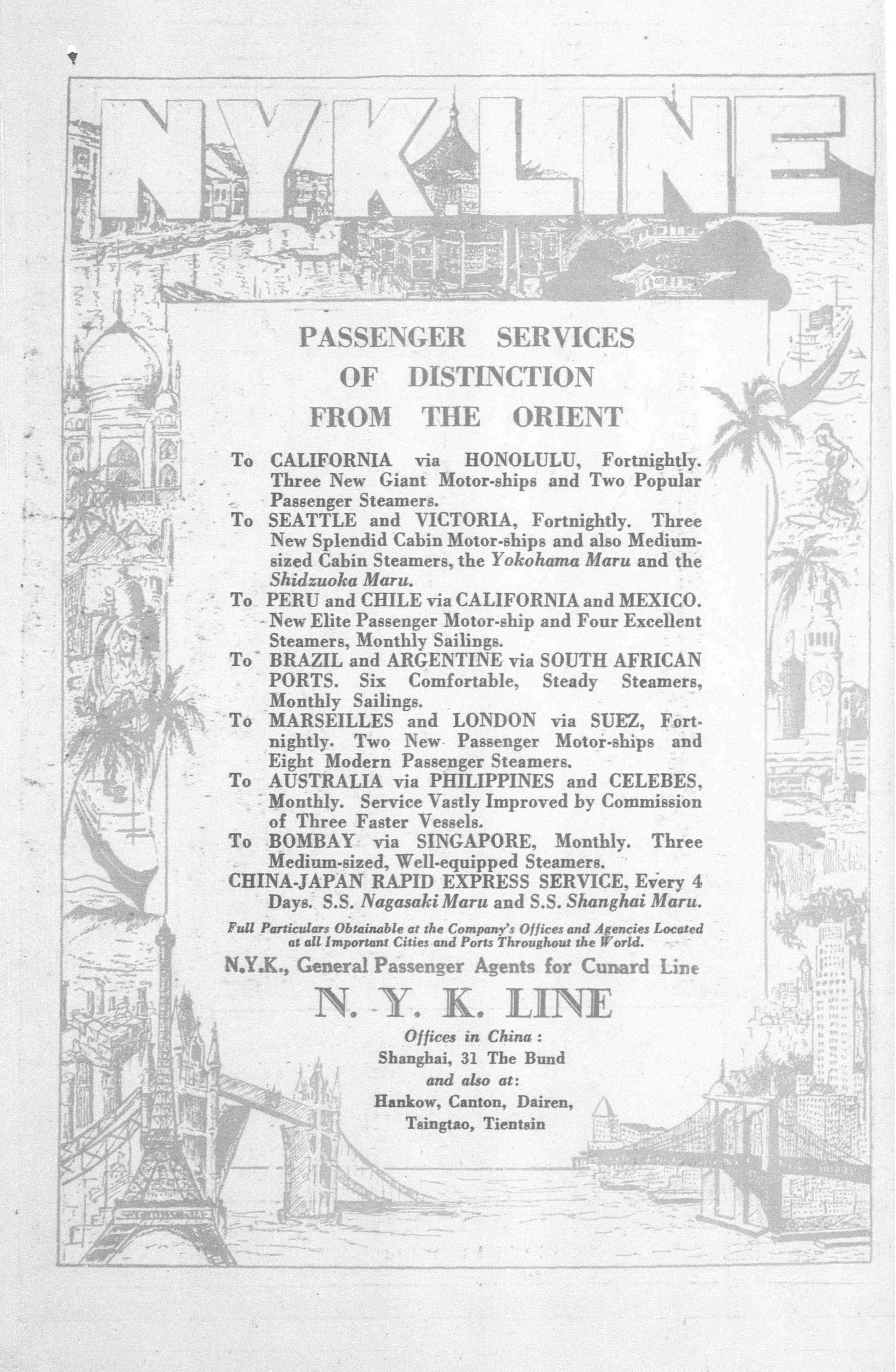
THE BULL IN THE CHINA SHOP
THE END OF EXTRATERRITORIALITY
IN CHINA?
CHINA AND JAPAN
THE "PRESIDENT HOOVER"



SEPTEMBER, 1931



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"We shall continue to demand the same respect and protection for the persons and property of American citizens in foreign countries that we cheerfully accord in this country to the persons and property of aliens."....

"The Administration has looked with keen sympathy on the tragic events in China. We have avoided interference in the internal affairs of that unhappy nation, merely keeping sufficient naval and military forces in China to protect the lives of the Americans who are there on legitimate business and in still larger numbers for nobly humanitarian reasons. America has not been stampeded into making reprisals, but on the other hand has consistently taken the position of leadership among the nations in a policy of wise moderation. We shall always be glad to be of assistance to China when our duty is clear."

On the Banks of the Yangtsze, Far Away

"To defend America, we must be prepared to defend its interests and our Flag in every quarter of the globe an American child crying on the banks of Yangtsze, a thousand miles from the coast, can summon the ships of the American Navy up that river to protect it from unjust assault "

(Extract from an address of Secretary of the Interior Wilbur, February, 1928)

Yangtsze for twelve months, praying to God that his appeal for succor will be heard by those in power who have solemnly pledged themselves to protect him from outrage. On the night of October 5, 1930, Rev. Bert N. Nelson, an American citizen, one of those who are in China for nobly humanitarian reasons, was kidnapped by the Honan bandits and held for ransom. After a year of fruitless official correspondence and forcible demands from the American Minister calling upon the Chinese Government to effect his release, this American citizen is still a captive. He has suffered untold agonies. He has been tortured, flogged, starved and laid low with sickness. Weary

to the point of exhaustion he awaits a merciful release from his prolonged martyrdom.

Absolutely nothing has been done by the Chinese authorities to procure his release. The jurisdiction of the recognized National Government of the Republic of China does not extend one hundred miles from the city of Hankow where this American citizen is held captive.

"THE PERSON AND PROPERTY OF A CITIZEN ARE A PART OF THE GENERAL DOMAIN OF THE NATION, EVEN WHEN ABROAD," declared President Coolidge in an address on April 27, 1927.

The Bull in the China Shop

Reflections on Reading Dr. Thomas F. Millard's Treatise, "The End of Extraterritoriality in China"

By GEO. BRONSON REA

for the "use of students of politics and international law" and incidentally for the admonition of the Foreign Offices of the "Three Pacific Powers" and the discomfiture of their die-hard nationals in China, Dr. Thomas F. Millard rises to the full dignity of the degree conferred upon him by an admiring alma mater.

In his new book, "The End of Extraterritoriality in China," Dr. Millard for the first time sails under his true colors as Adviser to the Government of the Republic of China. The publisher's cover announces that he also served the former Peking Government from 1919 to 1923 in the same capacity at the Paris Peace Conference, sessions of the League of Nations and the Washington Conference. This admission confirms his testimony before the Senate Foreign Relations Committee in 1919, that he was in the employ of the Chinese Government when he led the fight to kill the Versailles Treaty in the Senate and urged the American Government and

people to go to war with Japan over China.

Wilson fought a losing battle for China at Versailles and gave way on Shantung only to save the Treaty and the League. He placed his trust in the honor of Japan to restore Shantung and proceeded to usher in what he hoped would be a new world era under the aegis of the League, whose creation became an additional guarantee, if such were needed, that Japan's pledges would be faithfully carried out. China, however, was not in the least interested in the major objects of the Peace Conference. The Chinese went to Paris to arraign Japan before the bar of the Nations and entrusted the preparation and defence of their highly involved and irrelevant case to the American Delegation. When President Wilson, to save the peace accepted the best terms he could obtain on Shantung, the Chinese refused to sign the Treaty and dispatched an agent to Washington to undo his work. Mr. Millard accepted a mission, which, if successful meant a loss of prestige for the United States, the dishonor of its President and a revulsion of feeling in Europe towards the whole American people.

Wilson's political opponents in the Senate had no love for China nor interest in the final disposition of Shantung, but they welcomed the emissary of the Chinese Government and permitted him to testify before the Foreign Relations Committee, even after preliminary questions elicited the response that his expenses were paid by Peking. With Mr. Millard's help, the Republican senators killed the Treaty and sent their President broken-hearted to his grave. The incident stands in the records as one of the most flagrant interferences in the affairs of the United States on the

part of a foreign government.

The United States is not a member of the League. China, however, slipped in through the back door of the Austrian Treaty and has since sent to its sessions as adviser to its delegation the American whose activities were so largely instrumental in circumscribing its full usefulness! China has recently been enthusiastically elected to a seat on the Council of the League as a reward for invoking its aid in devising plans for the reconstruction of her finances and industries! But the League without the United States can do little to help China, outside of giving her good advice; thanks to Dr. Thomas F. Millard.

In view of the magnitude of the issues involved in the abolition of extraterritoriality by unilateral action, it is appropriate to invite attention to these past activities of Dr. Millard in order to understand better the workings of a mind which at all times has advocated strong action to enforce his dogmatic views on Far Eastern questions. In the same spirit that he helped undo the peace, kept America out of the League and advocated war between his own country and Japan in order to right the wrongs of China, he now recommends strong measures for the abolition of extraterritoriality.

In his latest book on the problems of China this determination to smash through all opposition, no matter who is hurt, is strikingly brought out. Dr. Millard's appointment as Adviser to the Government of the Republic of China in 1929 followed Dr. C. T. Wang's elevation to the portfolio of Foreign Affairs and his activities since that date indicate that he was specially selected by Dr. Wang to fill a post that once more called for complete subordination of American interests to those of China. Dr. Millard's job apparently was to study, report and advise on conditions in America and Europe that would influence and hasten the early abolition of extrateritoriality. One of the symptoms of his excessive egotism is to reproduce in his books his memoranda and confidential reports to the Chinese Government in order to support his theories.

In repeating this breach of official decorum in his recent treatise, Dr. Millard endeavors to mitigate the indiscretion by stating in his Foreword that "it is not implied when views stated in reports made by the author to the Chinese Government coincide with action of the Government taken afterwards, that the action was due to these reports." These quotations serve to indicate phases and sidelights of the political scene that bear on the negotiations and their outcome and which governments as a rule are inhibited from publishing."

After letting his Chief down gently in these few introductory remarks, Dr. Millard gives his readers plainly to understand by extensive quotations from his confidential reports that whatever progress has been made to date towards abolishing extraterritoriality follows closely his own recommendations. It is difficult to understand how the Adviser to the Government of the Republic of China can dissociate himself from his official capacity in disseminating publicity which his government is inhibited from doing, especially concerning the very problems he is engaged to assist in solving. His views and opinions must be accepted as those of the Minister of Foreign Affairs, who evidently read the proofs and conceded permission for the publication of confidential official decuments. In this, Dr. Wang gently passes the buck to his associate and disclaims responsibility for his indiscreet revelations and threats.

In view of the fact that the latest extraterritoriality notes from the British and American Governments have not been released for publication, but whose content Dr. Millard is fully familiar with, his book is clearly a move on the part of the Chinese Government to take its case over the heads of the recognized diplomatic authorities in order to influence the outcome. China has insisted upon secrecy in the conduct of these treaty revision negotiations and her wishes have been respected by the Governments of the Three Pacific Powers to the point where their own nationals are maintained in profound ignorance of what is taking place. The official presentation of the Chinese case releases the interested Powers from further consideration of Nanking's sentiments in the matter. The American and British Governments are now at liberty to publish all correspondence connected with the extraterritoriality negotiations and in justice to their nationals, this step becomes almost obligatory.

There has never been any serious conflict of opinion over the basic principles involved in the abolition of extraterritoriality. Every foreign Government recognizes China's right to exercise full sovereignty within its domains and is sincerely anxious to terminate a system imposed originally at China's own request. Every rightminded foreigner residing and doing business in China will welcome the day when their special privileges under the treaties can be safely abolished. The so-called die-hard opposition to the abrupt ending of the system arises from the knowledge that the Chinese Government as at present constituted, is powerless to exert its jurisdiction outside of a very restricted area. As a matter of fact, there is no government in China representative of the whole country. There is a government of sorts recognized by the courtesy of the Powers as such in order to maintain continuity of foreign relations and diplomatic intercourse, but even an advocate like Dr. Millard would hesitate before affirming that its rule extends to all sections of the country. Opposition to the abolition of extraterritoriality is based not so much on the lack of a stable government as the absence of

any government whatever; and from this all other facts proceed. For twenty years the country has been torn asunder by civil wars. A succession of military despotisms have usurped the power of government, been recognized by the Powers and then been overthrown and superseded by some other grouping of feudal overlords. The present Kuomintang Dictatorship at Nanking is no exception to the rule. Ever since its establishment it has had to fight with its back to the wall for its very existence, absorbing every cent of its revenues for the upkeep of the armies upon whose possession rests its sole mandate to rule. It is easy enough to make out a case for the abolition of extraterritoriality based on the assumption that China's juridical system has been brought up to date and that civil rule has been implanted throughout the country, but the facts belie this argument. Civil authority in China exists solely on paper. The military rule supreme.

It is superfluous to stress the impotence of Nanking or enlarge on a subject that has already been discussed from every angle. At the present moment, the very existence of the National Government is at stake; the whole future of China as a nation hangs in the balance. This is no time for disseminating official propaganda that can only alienate the sympathies of those nations upon whom China must rely for friendly assistance in her desperate struggle to survive as a state.

On its face, Dr. Millard's propaganda is intended primarily for American and British consumption, leaving the issue with Japan for supplementary treatment. He tells us that the Chinese Government at one time suggested that the legal issue be submitted to the Hague or to the League of Nations, but Japan's unwillingness to submit questions of her relations with China to any European body, blocked that proposal. China's attempt to again hale Japan before a World Court on the question of extraterritoriality is manifestly only an oblique move to have the Manchurian issue arbitrated by outside Powers, a procedure which Japan will never agree to. Dr. Millard's failure to comment in his usual anti-Japanese strain on this delicate issue shows great self-restraint, as on its settlement depends the whole future of extraterritoriality; perhaps even the fate of Manchuria.

China has been twice successful in transforming a conference for world peace into a court for the settlement of her disputes with Japan. China helped kill the efficacy of the League over Shantung and fought desperately at Washington in order to escape facing Japan alone in the negotiations for the restoration of this province. The Chinese would have raised the issue of Manchuria at Washington also, only that Japan's acceptance of Harding's invitation to attend the conference was conditioned on keeping Manchuria out of the agenda. In a round-table talk held between General Leonard Wood and General Baron Tanaka at Tokyo in September 1921, both sides laid their cards on the table and proclaimed their irreducible minimum for peace. Tanaka as spokesman for Japan, gave Wood to understand that his country would brook no interference in Manchuria; it would go to war as one man to defend its vital interests in that region. On the understanding that her rights in Manchuria would not be discussed, Japan sent her delegates to Washington committed to reduce armaments and assure the peace of the Pacific.

The validity of the 1915 Treaty is the crux of the problem and Japan stands firmly on the legalities of her position and refuses to submit it to arbitration. As Dr. Millard discovered in his ramblings around Europe, an appeal to the League to compel Japan to submit the 1915 Treaty to arbitration would bring no definite results as this question of treaty revision is one of the most touchy spots in European politics. Once the contention is admitted that a treaty extracted under duress is invalid and a way is opened for action through the League to nullify or revise its terms, it is certain that the Versailles Treaty will be assailed at Geneva by nations suffering under its provisions. The 1915 Treaty will therefore continue to be recognized by the Powers. China will have to deal direct with Japan in any controversy over its validity and application.

China prefers to simulate indifference to the fact that at the Washington Conference she placed on record the text of the secret Li-Lobanoff Treaty of Alliance of 1896, which completely altered the accepted version of events which led up to the Russo-Japanese war, and exposes her to a claim for any indemnity that Japan, even at this date, might see fit to advance if the case is reopened. If the invalidity of the 1915 Treaty be conceded, Japan's rights in Manchuria must be defined by the Portsmouth Treaty. Should China be successful in influencing the League to bring pressure upon Japan to submit the 1915 Treaty to arbitration, Japan would then

insist upon reopening the whole case and in view of the evidence furnished by China at Washington, demand the indemnity she was tricked out of at Portsmouth. As far as Japan is concerned it would seem to be a case of six of one or a half dozen of the other. Notwithstanding her huge sacrifices in 1905, and the fact that she is still paying interest on war debts incurred at that time, Japan apparently, is satisfied that the terms of the 1915 Treaty fully protects her vital strategic position and economic rights in Manchuria. She is not anxious to resurrect a dead issue, but if China insists upon opening the grave, then in self-defense, she will take the whole case back to Portsmouth and demand a stiff indemnity for China's secret partnership with Russia and her confessed culpability in making the war possible. China must either abide by the provisions of the 1915 Treaty or by submitting her case to arbitration, invite an adverse decision with the alienation of the whole of South Manchuria and a part of Inner Mongolia with perhaps a cash indemnity. Or, preferably, she can say nothing and saw wood, reserving to herself the right of unfettered national action pending such time as in her estimation she can face Japan alone with some hope of enforcing her viewpoint. Here is a situation involving the honor, dignity and prestige of two nations where the Kellogg Pact may not operate. For years, we have watched this crisis developing and have tried to present impartially the facts, as it is a foregone conclusion that if China in her present weakened condition continues to raise this issue at every conceivable opportunity in the hope that she can talk Japan out of Manchuria, she is due for disillusionment. Common sense counsels a conservative waiting policy on the part of China and the acknowledgement of certain basic truths that up to the present she has declined to consider. Until China and Japan come to some permanent accord over these fundamentals as applied to Manchuria, it seems a waste of time to discuss seriously the extraterritoriality problem as a whole. Only the most careful diplomacy and farsighted statesmanship can arrive at a solution of this problem by amicable agreement and it is illuminating to note that in regard to Japan, Dr. Millard is careful not to counsel the same drastic action that he urges his government to adopt in treating with America and Great Britain.

Dr. Millard's reports urging immediate action to convince the American and British Governments that China will brook no further delay in abolishing extraterritoriality reveals that on the one hand he was inciting the Chinese Government to strong measures and on the other attempting to coerce the American Government through threats of what will happen to American citizens in China, unless extraterritoriality be immediately abolished; playing both ends against the middle.

In August 1930, Dr. Millard was telling an audience at the Institute of Politics in Williamstown that "the end of extraterritoriality has now become a virtual necessity and that the United States must revise its treaties with China or jeopardize the safety of its citizens." This, on its face, was clearly an attempt to intimidate the American people in order to bring pressure to bear on Washington to submit immediately to the Chinese viewpoint.

At the same time he was confidentially advising Nanking that; "none of the principal Powers, nor the League of Nations, will initiate action to change the treaty status in China. The Chinese Government therefore can allow the status quo to continue indefinitely or it can force the issue by action. This observer's opinion is that if the Chinese Government wants to get action it will have to force it."

Dr. Millard quotes a "prominent man in the American Government" as saying to him: "After all, why should the American Government move to change China's international status as long as the Chinese will allow the status quo to stand? Now there are just four men in the American Government whose remarks on extraterritoriality are of any value in forming a correct estimate of the government's policy: the President, the Secretary and Assistant Secretary of State, and the Chief of the Far Eastern Division of the State Department. Perhaps one of these high officials confided the Administration's policy to Dr. Millard, for he concludes that "under the circumstances the American Government feels that it cannot with good grace consent to abolish extraterritoriality now unless the other principal Powers agree, but if China ends that status by her own action the American Government probably will feel relieved. That may be so of the British Government also."

Well, if that is the real attitude of the American Government,

why the threats at Williamstown?

Here we see Dr. Millard egging on the Chinese to take drastic action in order to relieve Washington from anxiety, while at Williamstown he threatens Washington with dire consequences unless it consents to the immediate abrogation of its treaty status! Dr. Millard is probably correct in assuming that there is an understanding between the Three Pacific Powers in regard to their policy towards extraterritoriality and that the United States cannot take the initiative in any move toward its abolition. This is as it should be. The British stake in China is nearly \$1,750,000,000; Japan's is over \$1,400,000,000, while American investments are probably not more than \$200,000,000, of which \$80,000,000 is missionary and educational. We have no concessions of our own, but reside and do business in the concessions of other Powers whose police and armed protection have been the one guarantee that our lives and properties would be safeguarded. It would be the height of ingratitude and selfishness for the United States at this time to take the lead in any movement that would jeopardize the rights of those Powers whose protection and hospitality we have so long enjoyed. No matter how much the American Government might desire to show its sympathy and friendship for China by a hasty sacrifice of its own rights and investment, a sense of fair play and appreciation of the facts obligates it to co-operate with the other principal Powers. To suggest as Mr. Millard does in his confidential reports to Nanking, that the American and perhaps the British Governments would feel relieved if China ends this status by her own action, implies that they are being held back out of consideration for Japan and would be glad to find an avenue of escape from such a compromise if a way could be found to do so without being caught. In other words, he suggests that the American Government would gladly throw Japan over and side with China, if the latter would only provide an excuse for such a breach-of-faith.

In this we once more find Dr. Millard up to his old anti-Japanese tricks, sowing the seeds of distrust and endeavoring to push the Chinese into a show down with Japan in the expectation that the United States will stand by her. The answer to Dr. Millard's impressions, suggestions, observations and high advice to the Chinese Government can be found in the pointed remarks of Assistant Secretary of State Castle in describing Japan's rôle in the Far East and his equally eloquent and more forcible utterances at Williamstown concerning China. It will be much safer for Dr. Wang to be guided by "Bill Castle" than by "Tom Millard."

Dr. Millard is quite positive that neither America or Great Britain will take any steps to enforce observance of the treaties once China has taken unilateral action in denouncing them. This may or may not be true. In any event, it would be most unwise and perhaps dangerous for China at this time to put the theory to the test. Leaving Japan and Manchuria out of the picture, the course that might be pursued by Washington or London in protecting their treaty rights and citizens in China would probably be determined by the circumstances. It is possible that an incident might arise that would exhaust the patience of these governments and snap them out of their present passivity into immediate action in defense of their nationals.

Dr. Millard's book leads up to and covers the Thorburn incident which he disposes of in a few words. "It is plain, of course," he says, "that extraterritoriality has no application to this case. Young Thorburn had extraterritorial status when he set out on his adventurous trip and it did not help him any. The foreign missionaries who have been killed and kidnapped in China have had extraterritorial status but that did not and could not protect them. If these foreigners or their surviving families have any remedy it is not by invoking extraterritoriality which does not apply to their cases, but lies in representations to the Chinese Government through diplomatic channels, and that can be done regardless of whether extraterritoriality exists. The Chinese Government may discover and punish the persons who injured or killed young Thorburn, if he was killed, or they may in time apprehend and punish the bandits and communists who have lately killed and abducted missionaries, but if that is done it will be Chinese authority and Chinese law, and not extraterritoriality, that brings the offenders to justice."

It is plain that this was written by Dr. Millard before Sir Miles Lampson flew down from Peiping bearing a peremptory message from his Government to be handed personally, not to Dr. C. T. Wang, but to Generalissimo Chiang Kai-shek. Dr. Millard still has an advantage over other journalists in that, as High Adviser to the Government of the Republic of China, he is fully conversant with the import of this strongly worded communication informing

Nanking that it must bring the guilty military authority to book and hand over the person of Mr. Thorburn, if he is alive and "carry out the ordinary obligations of a civilized state."

It must have jarred Dr. Millard out of his complacency to find that the long-suffering, patient and over indulgent Laborite Cabinet had reverted to the traditional policy of Britain in respect to the protection of British subjects when treated unlawfully in other countries. By this time, he will also have carefully perused and digested the leading articles from representative organs of British opinion which clearly reveal that British editors are fully alive to the real situation in China and the inability of Nanking to enforce its wishes or commands even in those restricted areas within which it is alleged to exercise authority. Even the Manchester Guardian admits that under these circumstances, Nanking's claim that extra. territoriality is out of date, falls to the ground, while the Glasgow Herald reminds us that if the indulgence of the British Government to the pretensions of Nanking is to mean that British nationals in China will be at the mercy of a corrupt officialdom, a change of policy will have to take place... It adds, that if Nanking interprets the delay on the part of the British Government in moving to protect its nationals as a weakness, "it will have a rude surprise." It is very plain that the British have arrived at the point where to put it mildly, they are "fed up." Mr. Millard may yet have to admit that extraterritoriality has considerable application to the Thorburn case and that instead of feeling relieved over China's unilateral abolition of extraterritoriality, Downing Street may be downright peeved.

Had he waited another week or two, he could have included the Tucker case and been a little less cocksure of the efficacy of his remedies. By this time, the Adviser to the Chinese Government may have been informed of the very casual observation of the American Admiral in Command of the Asiatic Fleet (who was summering in Tsingtao at the time) when it looked as though in defiance of the treaties Dr. Tucker would be tried and summarily executed by the Chinese authorities. His offhand remark, addressed to the representative of the highest Chinese official of the port, was to the effect that: "If Dr. Tucker was not surrendered immediately to the American consular authorities, it would be a shame to have to send his marines on such a long, hot, dusty railway journey in order to take possession of the prisoner." Nothing more. American Admirals do not make "jocular remarks" on such subjects. McVay meant exactly what he said and that equally correct and suave "Leatherneck" colonel of his staff would have carried out his orders.

If Dr. Millard will ponder over this, he will understand its significance. It may probably dawn upon his one-track mind that until the present treaty expires and some new agreement supersedes it, the American Government will compel adherence to its provisions. It begins to look as though the British Government will also snap out of its pacifist coma and revert to its traditional attitude towards respect for its treaty rights. Dr. Millard, thundered his threats at Williamstown and advised Nanking to take drastic action to enforce his viewpoint. He called for a show-down and got it. Dr. Millard never did understand his own countrymen. He's from Missouri.

Dr. Millard might also see in the attitude of the Japanese towards the illegal confiscation of their goods by Chinese Boycott Associations something of the same determination to protect their rights. If the Chinese Government is powerless to extend proper police protection to Japanese property, it constitutes an open confession of its weakness and inability to discharge its treaty obligations. The Japanese have made no offhand, jocular remarks about what they intend to do, but it would open Dr. Millard's eyes, if he would take a night taxi ride out through the Hongkew district, especially in the neighborhood of the Japanese mills, and note the occasional armored cars and trucks filled with Japanese soldiers that go rumbling through these streets, ready for business. He might see something of the same thing in Tsingtao, where the Japanese district is policed by armed patrols from the Japanese warships in the harbor. These measures also have a very deep significance, whose point it would be unwise to ignore. Long before the date set for China to assume jurisdiction over all foreigners, that is, by January 1, 1932, it is very probable from present indications that a far more formidable issue will be raised by Japan.

Although the Chinese Government cannot give absolute sucurity to property nor guarantee absolute safety to its own citizens or foreigners within its territory, it can faithfully adhere to and

discharge its treaty obligations where its own National officials are concerned. Had the Chinese acted on Dr. Millard's advice, they would probably now be bewailing the fact that another "imperialist

power" had invaded their territory with armed forces.

Foreigners opposed to the immediate abolition of extraterritoriality based on the absence of any responsible government exercising jurisdiction over the whole country, are also adverse to having their interests sacrificed to the exigences of Chinese politics. In some manner, not clearly explained, the Chinese contend that extraterritoriality constitutes a barrier to unification and the enforcement of law and order and not until its abolition can real national unity be attained.

The real problem for China to tackle first is the unification of the country under a government that can discharge its functions and obligations to its own citizens. Mr. Millard says that "foreigners in an alien country have no right to expect and claim better security for their property and greater safety for their persons than are had by citizens of the country." Quite right. But when the citizens of the alien country have no rights; where they are in places reduced to slavery; their property and household goods confiscated; their crops and food seized; their women violated; where every cent that can be squeezed from the unfortunate people goes to perpetuate the system that holds them in bondage; where they are starved, tortured, beaten and massacred and in other inhuman ways hammered into submission; in effect, where there is no civil authority, no courts to dispense justice impartially; where the military, the bandit, the pirate, and the kidnapper reign supreme; there is no reason why foreigners should invite the same fate when they have treaties and isles of safety which at least hold out certain guarantees for their protection.

Dr. Millard might explain why the International Settlement and French Concession are overcrowded by wealthy Chinese from all parts of the country, bringing with them the remnants of their fortunes and investing them in Shanghai real estate; why all available choice houses in the Settlement and Concession are occupied by Chinese families; why they decline to go outside the settlement limits to live; in short, why they are reluctant to reside under their own beneficent laws or seek protection from their own authorities. Dr. Millard might also explain why as an ardent champion of China's pretensions, he does not personally reside at Nanking, at Soochow, Hangehow, or even nearby Chapei, Nantao or Woosung, not to mention any of the provincial capitals or hsien towns, where he would have no right to claim or expect better security or protection than his Chinese neighbors. Dr. Millard does not refer to these phases and sidelights of the extraterritoriality problem that bear on the negotiations and their outcome and which his government is inhibited from recognizing or commenting upon.

It is true, as Dr. Millard points out, that there is no standard to measure the stability of any government, nor can any government give absolute security against criminal acts, bandit or pirate outrages, the depredations of warring armies in the field, or the excesses of mobs or revolutionary bodies. But in all the countries that he mentions to support his contention, the fact remains that there has been a continuity of authority and where revolution has temporarily upset the machinery of government, law and order has been more or less promptly restored. By no stretch of the imagination can the anarchy in China be compared to the sudden upheavals in other countries for the overthrow of an unpopular

government.

For want of a better name, the interminable civil wars of China wishes. have been accepted by the outside world as the outburst of a revolutionary spirit; the groping of a backward people towards the light of democracy and liberal government. This is pure unadulterated bunk manufactured for the consumption of the sentimental foreigner; the window dressing which distracts attention from the realities. The wars of China are wars of conquest; wars for power and plunder; wars of bandit generals and an upstart military class whose only conception of government is absolute submission to their rule. There is no political revolution in China. There is, however, a state of war between feudal chieftains and swashbuckling military autocrats for the conquest of each others' territory that equals in ferocity and uncompromising hatred the wars of Napoleon or the last Great War fought for supremacy in Europe. And, as the Great War impoverished Europe and nearly destroyed civilization, so will the wars of China drag her down to ultimate ruin and carry her neighbors and the rest of the world down with her.

Some day, the truth about conditions in China will have to be faced by the rest of the world and the dictates of humanity may then outweigh all other considerations in applying a remedy. The great catastrophe in Europe was precipitated by a military autocracy that held certain states in complete and abject subservience to its will. When the United States declared war against Germany, President Wilson was careful to differentiate between the German people and the Prussian military machine that controlled their government. The United States did not go to war against the German people; it took up arms to liberate the people of Europe from the rule of their military overlords; "to make the World safe for Democracy."

The future of world peace and prosperity; the happiness and welfare of one quarter of the human race, may necessitate the application of the same doctrine as the only way to free China from its military taskmasters. In the final application of that doctrine several new states were created to preserve the balance of power and assure the peace of Europe. History has a strange way of repeating itself. Diplomats and statesmen invariably seek precedents for the solution of world problems and the principles employed to preserve peace and stability in Europe may ultimately have to be

extended to China.

The Three Pacific Powers together with France and Italy may grow weary of being threatened by a government which owes its existence and status to their continued recognition and moral support. Dr. Millard has very minutely outlined the program that the Chinese Government will follow in abolishing extraterritoriality by unilateral action, in order to intimidate the Powers into surrendering their treaty rights and safeguards. Dr. Millard tells us how it is to be brought about in his report to the Chinese Government, dated December 28, 1930. In this highly illuminating document

he says:

I would not press the negotiations now but would let them die out gradually. As long as negotiations are supposed to be going on the Government cannot, without seeming to act abruptly and discourteously, suddenly take unilateral action. The Powers can, if China permits, drag negotiations along endlessly and thus stave off action by China by pretending to hold out hope of agreement when in fact there is no present intention on their part of agreeing to terms that accord with China's minimum demands. I therefore suggest that after a month or two the Government will let it be known that the negotiations have reached a deadlock and for the time will be suspended. Soon thereafter, let it be known that the Government despairing of arriving at its minimum requirements by negotiations, considers that unilateral action is the only way to cut the Gordian knot. Follow that by a forthright declaration that on and after a date stated in the declaration that China will not recognize the existence or operation of extraterritoriality in her domain, will no longer co-operate in making that status effective and will take measures to render it completely ineffective I think a period of several months should be allowed between the declaration abolishing extraterritoriality and the making of the declaration effective."

This is extremely interesting as the procedure outlined is exactly what Dr. Wang has followed. It reveals that the Master Mind behind the abolition of extraterritoriality by revolutionary diplomacy is not the brilliant Chinese statesman, but the High American Adviser whose egomania and warped mentality is once more precipitating an issue that may bring humiliation instead of victory to a nation woefully unprepared to enforce respect for its

It is only necessary to read the following Kuo Min dispatch from Nanking dated September 11, to understand that Dr. Millard's program is being scrupulously followed by the Chinese Government.

"As the date for the assumption by Chinese courts of jurisdiction over all foreigners in China is approaching, preparations are being made by the Special Area District Court (International Settlement) for the construction of new premises to house the proposed Special Chamber for the trial of cases involving foreigners, which will be inaugurated on January 1 next year This concrete step on the part of the local Court towards preparing for the assumption of jurisdiction over foreigners in Shanghai is taken as a definite indication that the new regulations governing jurisdiction over foreign nationals promulgated by the National Government some time ago will be put into effect on January 1, 1932, whether or not the negotiations with the interested Powers for the abolition of extraterritoriality are brought to a successful conclusion by that time."

This is very much to the point and it would be unwise for the foreign community or their diplomatic representatives to treat it lightly for Dr. Millard has gone even further and shown us how the Chinese Government will deal with the situation arising out of any

conflict of jurisdiction over foreigners in Shanghai.

"Presumably" he says, which interpreted means positively, "the Chinese Government will order its citizens, after January 1, 1932, not to resort, under penalty, to any foreign courts in China for any purpose whatsoever. It will order the Chinese courts not to recognize any process of those foreign courts. It may go further, logically, and debar from Chinese courts and penalize severely any Chinese lawyers who will practice in foreign courts. If one foreigner obtains a judgment against another foreigner in a foreign court and the loser goes outside the foreign municipal area to evade the judgment, the Chinese Government need not co-operate to make the judgment effective..... If the Powers are obdurate in trying to continue extraterritoriality in the foreign municipal areas the Chinese Government might regard that as a flagrant disrespect of its prerogatives and refuse to apprehend and extradite foreign offenders who escape to China after committing offenses elsewhere...... If Chinese cannot resort to a foreign court they will not be able, in one of the foreign municipal areas, to sue some foreigners who owe them money. A logical result of that situation is that the financial credit of foreigners with Chinese will be restricted. Foreigners whose governments continue extraterritorial courts in China after January 1, 1932, may find themselves without legal means of suing Chinese even inside the foreign municipal areas if the Chinese Government as a retaliatory measure would not recognize those foreigners in a Chinese court.....Nor does it promise to solve matters for the Powers to menace China or to employ force to keep extraterritoriality nominally alive for a few more years. That the system can be kept actually alive after the Chinese deny its legality and refuse to co-operate in making it effective, short of an extensive foreign military intervention, is difficult to conceive."

Dr Millard need not fear. The Powers will never go to war with China to enforce compliance with the treaties. They don't have to. They have only to accept the realities of the situation. withdraw recognition from Nanking and enter into relations with the several de facto governments that exercise real authority within their respective territories. The Chinese answer will probably be that such a step would unite all factions in a common cause against the foreigner. The rejoinder is obvious. If the threat to recognize the realities is the only means by which the warring Chinese factions can be induced to compound their differences and unite under a central government, the sooner such action is taken, the better it will be for China and the Chinese people. On the other hand, such recognition might be welcomed by Canton, Mukden and other independent regions whose leaders refuse to submit to the dictatorship of Nanking.

To indulge in threats of what Nanking will do in the event its wishes are not immediately complied with, is the height of folly. Dr. Millard as usual has overplayed China's hand. He has been called once and laid down a pair of deuces. Bluff will not succeed. Why attempt it when the next show-down may disclose that instead of a royal Chinese flush, Nanking is holding a busted Mongolian straight. Why discuss seriously the abolition of extraterritoriality when at the rate we are progressing, in a few years we may have to deal with four or more new Asiatic states created out of the ruins of

that was once the Chinese Empire?

A solution that international politics may be reluctant to apply may become imperative for the sake of humanity and world peace. While the League or the Three Pacific Powers may hesitate to recognize the realities of the situation, Moscow has no such scruples to hold her in check. The outer edges of China are being nicked and chipped off. The big Red Bull is running amok inside the Shop. Unless some effort is made to preserve the pieces there will be precious little left to patch up into a presentable whole.

China and Japan

Twould be interesting and instructive at this moment to pause and speculate on what might have been had the Chinese Delegation at Paris accepted in a different spirit a decision which after all assured to China that Shantung would be restored to her. Wilson, Lloyd George and Clemenceau guaranteed Japan's pledge and the creation of the League assured its fulfillment. The Chinese, however, would not confront Japan alone. They feared that in any direct negotiations over the retrocession of Shantung, Japan would use it as a trading card to validate the 1915 Treaty and solidify her position in Manchuria. In order to avoid meeting Japan alone over this issue, the Chinese dispatched Dr. Millard to Washington to break the treaty in the Senate. Their emissary engaged in a publicity campaign that excited the sympathies of America for China to the point that hostilities with Japan seemed imminent. It took another world conference to avert a war which, had it taken place, would have brought more injury and humiliation to China than to the actual combatants. It is an open point even at this date as to which nation would emerge victorious from a conflict that would leave both sides prostrate and

regretting that it ever occurred.

At Washington, China again escaped having to deal with Japan over the restoration of Shantung. That was all amicably arranged with Japan's acquiescence. China fought desperately to have Manchuria treated in the same way but ran up against a stone wall. Manchuria was outside the agenda. What China could not accomplish by force or diplomacy, has been attempted by economic pressure, boycotts, agitations, evasion of agreements and a program of industrial strangulation. China has blustered, threatened, pinpricked, protested and even announced her intention to fight to the last man to defend her rights. But the basic problem remains unsolved. Eleven years after Versailles, China can no longer evade the issue. Instead of a world propaganded into distrust of Japan, we now find a world in which Japan is honored and exalted, one of the Three Great Powers, whose voice is respectfully listened to in the council of nations. At a time when the issue with Japan cannot be much longer postponed, China finds that neither the League, the United States or Russia will interfere. She must stand on her own bottom after exhausting every alternative and exploring every avenue of escape.

To attain her ends, China delayed the Peace; incapacitated the League; broke the Anglo-Japanese Alliance; and opened her doors to Russia. A fierce internal conflict is sweeping away the last vestiges of law, order and responsible authority. Mongolia, the natural buffer between China Proper and Russia, has become a Soviet republic, "The menace from the direction of Urga," that Viscount Chinda foresaw in 1919, has since become a stern reality. The Soviet has flanked Japan's position in South Manchuria and cleared a direct road through to Peking. Sinking is slipping away. The Barga Mongols are prepared to follow the lead of Urga. Dr. Sun Yat-sen invited the Soviet into China Proper and with their aid and under their leadership established the rule of the Kuomintang at Nanking. With slogans and methods that worked the masses into a frenzy of nationalism, Communistic ideas gained a foothold in central China, and to-day the hungry people under leaders schooled in Moscow have turned on their rulers and threaten the very existence of the State. Manchuria, developed largely with Japanese capital, is facing economic disaster through the cupidity and stupidity of its Chinese overlords. It is only a step across the almost invisible dividing line between Communism and the Chinese confiscatory system of taxation in Manchuria and another year of world economic depression and falling off in the export demand of soya beans may swing North Manchuria definitely into the Soviet sphere. The menace from the direction of Urga which eleven years ago, could only be dimly discerned by expert observers has assumed ominous proportions.

Yet the Chinese seem to welcome any humiliation from the North, protesting only when Japan moves to protect herself against their indifference and weakness. China apparently will submit to any indignity or aggression at the hands of Russia, but let Japan make one move to protect her interests against a menace that

endangers her existence, the Chinese interpret it as another proof that Japan is secretly carrying forward an imperialistic program of conquest at their expense. The Chinese will never protest against Russia's encroachments on their sovereignty, knowing full well that the other Powers can exert no influence upon a government that is safe from outside interference and impervious to criticism, but they will call onto High Heaven, the League, the Hague and Washington to witness the criminal and unjustifiable aggression of Japan if she makes the slightest move to protect her interests in Manchuria against forces which China herself is impotent to resist. In having her own way, China has become a menace to herself, to her neighbors and to the world. Unless a miracle happens and happens soon, China will go down to ruin. The collapse of the Nanking Government will be quickly followed by the ascendency of Moscow, the Sovietization of Eastern Asia and the end of European influence in this part of the world. No matter which side emerges triumphant from the impending struggle, it will leave the country prostrate, a prey to the forces of evil and disorder.

Europe and America are facing stupendous problems upon whose solution rests the future of our social system and liberal government. As we approach the real crisis in the affairs of China, the attention of the other nations is concentrated on their own troubles. Alone, of all the great Powers, Japan is the most vitally concerned and has the most at stake. Her economic future, nay even her very existence as a nation, is indissolubly linked with the fate of China. Japan, ready and willing to assist, desirous above all things of living in harmonious accord with her great neighbor, finds her hands tied. With her own house tumbling about her ears, China is at sword's point with Japan, employing every means to destroy her trade and drag her down to economic ruin. Public opinion in Japan is inflamed and severely critical of a Government whose policy of conciliation and forbearance under severe provocation has encouraged the Chinese to further efforts to attain their end. If the policy of Baron Shidehara fails to convince China of Japan's sincerity and friendship, if the Minseito party goes down to defeat, and a new cabinet comes into power committed to stronger action to preserve Japan's rights in Manchuria, it will be difficult for China to sway world opinion in her favor. Baron Shidehara has exhausted every possible compromise short of abject surrender of Japan's legal rights in order to placate Chinese nationalism. He has established a reputation for honesty, fairness, conciliation and a determination to maintain peace that places him amongst the foremost statesmen of the world; more worthy of the Nobel Peace Prize than others who have been awarded this distinction. He has built up a case for Japan that even if it fails to command full sympathy will enjoin respect and a scrupulous neutrality on the part of other nations. China has selected a most unpropitious moment to raise issues that can be solved to her satisfaction, only by a strong, united nation possessing within itself the means to command respect for its wishes.

What then has it profited China to defy the Powers at Versailles and refuse to sign the Treaty, in order to avoid meeting Japan alone for the settlement of the Manchurian dispute? Eleven years ago, before China's confession of the existence of the Li-Lobanoff alliance, she stood a fighting chance of gaining her point over the invalidity of the 1915 Treaty or at least of circumscribing Japan's economic activities in Manchuria through a new agreement. At that time, world opinion would have supported her. To-day, China finds a Japan strongly intrenched in Manchuria behind an investment of a billion and a half yen, fully determined to hold and fight for what she has legally acquired. Nanking's inability to exercise jurisdiction in Manchuria, assert its authority, extend protection to its own people or discharge its treaty obligations, may bring upon it a repetition of what happened once in Formosa, when the Tsungli-yamen incautiously admitted China's inability to exercise jurisdiction over the natives. If Nanking claims jurisdiction over Manchuria and Mongolia, it must be able to assert its authority and be responsible for the protection of lives and properties in those regions. China's surrender of authority in Manchuria in 1896 brought about one war and her meek acquiescence in the Soviet's amputation of Mongolia and the steady advance of Soviet influence and authority in the border lands conterminuous with South Manchuria, may precipitate another clash.

There is something radically wrong with a diplomacy that fails to read aright the trend of events in Manchuria. Nanking, fighting for its very life, is in no position to pursue a policy that is arousing the hostility of every element in Japan, irrespective of party align-

ments. Dr. Wang might with considerable profit follow the lead of his Canton colleague, Mr. Eugene Chen, and visit Japan for a frank, heart-to-heart talk with Baron Shidehara, substituting modern scientific diplomacy for the medieval methods still used in China. Shanghai newspapers were not fully informed as to the nature of Mr. Chen's visit to Tokyo and it is enlightening to read the interview with him published in *The New York Times* of August 14, in which he said:—

"The pin-pricking policy Nanking pursues leads nowhere except to war. Manchuria, with 30,000,000 Chinese, has assured its future as an integral part of China. The only way to lose Manchuria would be through war with Japan, but nobody wants

war, except maybe Chiang Kai-shek."

In attempting, even unofficially, to establish a personal contact with Baron Shidehara and other spokesmen for Japan in order to discuss frankly and openly the points of difference between the two nations, Mr. Eugene Chen merits unstinted applause. For the present, he is the Foreign Minister of a rebel Chinese government, which to-morrow either by victory or compromise may again become the recognized National Government of the Republic of China. His attempt to discuss policies face to face with the Foreign Minister of Japan is not only highly commendable but in line with up-to-date methods now being applied to solve the major problems of Europe.

In making the advance, Mr. Chen is living up to Dr. Sun Yat-sen's bequeathed policy and program for establishing Sino-Japanese solidarity. It is strange that a government dominated and ruled by the principles laid down by its Founder, should make an exception of his wishes in regard to Japan. In these matters, the Nanking régime has failed to grasp the realities and has caused a rift between the two nations that is rapidly becoming too wide to bridge. Japan is not out for conquest or the annexation of Manchuria. For years, her spokesmen have clearly enunciated their policy towards this region, which, simmered down to a few words, means a recognition of certain historical facts on the part of China and the right of Japan to her acquired legal rights upon which

depends her economic life and strategic security.

Japan is determined to preserve her rights and position in Manchuria, no matter how many million Chinese have colonized and peopled the region and is now formulating a new policy to be applied for the protection of these vital interests. Some time next month an important conference will be held in Tokyo to consider the entire question of Japan's future policy towards Manchuria and the indications are that the so-called moderate policy of Baron Shidehara will be superseded by a firmer attitude. Public opinion in Japan is thoroughly aroused over the situation in Manchuria. The Japanese have wakened to the fact that China is making a definite drive to dispossess them of their rights and investments in Manchuria and are frankly nervous and apprehensive in contemplation of the more serious menace that looms in Mongolia and North Manchuria. Over three hundred incidents await diplomatic solution, and the cases keep piling up. Japan has sent the "Genro" of her diplomats to direct the South Manchuria Railway and her foremost military strategist to govern Korea in order to have them investigate and report on the situation and suggest a remedy. In the face of a national crisis, party lines are being eliminated and all Japan will stand solidly behind any program approved at the forthcoming conference.

The Chinese have interpreted the prudent policy and modest diffidence of Baron Shidehara as a sign of weakness and have redoubled their efforts to circumscribe Japan's activities in Manchuria. But no one who knows Japan's Foreign Minister will accuse him of weakness. Baron Shidehara is prepared to surrender all special rights, privileges and concessions which for the benefit of China ought to be restored to her, but he is as adamant as Baron Tanaka or the most hard-boiled militarist in upholding those Japanese rights and interests centered in Manchuria and considered

vital to the welfare of his country.

The tense situation only awaits some new incident to precipitate a crisis and in the present temper of both sides some hot-headed jingo or irresponsible idiot may drop the match into the powder magazine.

Manchuria has been a menace to world peace long enough. It is high time the dispute is settled one way or the other and it is to be hoped that wise counsels will prevail at Nanking and a formula found whereby China can honorably find a way to (Continued on page 533)

Approaching the Showdown

The Real Issue Between China and Japan

7s a result of the alleged murder and cremation of Captain Nakamura and his three companions while travelling in Mongolia, the Japanese army has worked itself into a frame of mind that bodes ill for the continuance of peaceful reof mind that bodes ill for the continuance of peaceful relations between China and Japan. The facts as reported are almost indentical with those which finally aroused the British Government to make strong representations to Nanking over the disappearance and death of young Mr. Thorburn and from the legal point of view the principle involved is similar to that which influenced the American Government to take a firm stand in the Tucker case. In these three incidents, there is no question of bandits or other lawless elements defying the recognized authorities, the offenders in each case being officials of the Chinese Government.

The Thorburn and Nakamura cases are still under official investigation and until a final report is released, it is unwise to jump to hasty conclusions, for although the evidence seems to convict the Chinese military officials to taking the law into their own hands, it may develop that they were acting within what they considered their rights in these matters. The military may have accepted literally the Government's proclamation that extraterritoriality is abolished; secret orders may have been issued in regard to the treatment of suspicious foreigners arrested outside the concession areas. The exigencies of domestic Chinese politics may have called for drastic measures to unite all factions under the leadership of Nanking. Or, Thorburn may have been honestly mistaken by the military for a dangerous Russian communist and Captain Nakamura as a Japanese spy. The real facts in both cases have yet to be established.

The United States went to war with Spain in 1898 on a wave of indignation resulting from the blowing-up of the battleship Maine in Havana harbor, allegedly by Spanish officials, yet to date no convincing proof has been adduced to support or justify this verdict. The shot fired at Sarajevo plunged the whole world into war. The murder of Captain Nakamura may also result in a similar catastrophe unless, patience, prudence, cool judgment and careful diplomacy are permitted to have full play pending an exhaustive investigation

to establish the facts.

There is, unfortunately, a tendency in China to accuse the Japanese of deliberately manufacturing an incident that will offset the massacre of Chinese in Korea in order to escape payment an of indemnity and the humiliation of making an apology and punishing the military officers responsible for maintaining public order. This is to be regretted as it is bound to be interpreted in Japan as a proof of China's insincerity. In the Korean case, the Japanese Government immediately expressed its regrets and willingness to fulfill its obligations, assuming responsibility for the payment of a fairly adequate condolence indemnity to the survivors of the murdered Chinese, the punishment of the offenders and guarantees

for the future protection of Chinese residing in Korea.

There is plainly no intention to shirk responsibility, but no measures that Tokyo may now take to satisfy public opinion in China can be effective. There is always the danger that the easily excited Koreans will again retaliate on the persons of Chinese domiciled in their midst for injustices and persecutions visited upon their brethren in Manchuria by Chinese landlords and police officials. The Korean tragedy could have been foreseen and averted and from this point of view the Chinese are somewhat justified in charging the Japanese authorities with negligence in taking adequate measures for the protection of their nationals. Yet at the same time, the Chinese reject any imputation that they are in any way to blame. In this, we come to the same old stone wall, facing the inescapable truth that all these incidents have been made possible by China's refusal to recognize the validity of the 1915 treaty which concedes to Japanese subjects the right to lease land in Manchuria.

It is well known that the Chinese authorities in Manchuria have issued strict orders prohibiting their nationals from selling or leasing their lands to Japanese in order that the clause in the 1915 Treaty should become inoperative and valueless to Japan.

With no intention of mitigating, excusing or defending the atrocities visited on the persons of peaceful Chinese by the Korean mobs or of absolving the Japanese Government from its responsibility to provide protection to these unsuspicious Chinese living on the rim of an active volcano, it is appropriate to invite attention to the

forces which made the erruption inevitable.

Wanpaoshan was in itself a very minor incident, the culmination of a series of similar alleged injustices against Koreans which tried the patience of a long suffering people whose government had taken no effective steps to safeguard their rights; the direct outcome of Japan's policy of peace, conciliation and determination to remain on friendly terms with China. Instead of interpreting this policy as a manifestation of Japan's sincere desire for good neighborly relations, the Chinese, encouraged by irresponsible anti-Japanese foreigners, accepted it as a confession of weakness and redoubled their efforts to evade their agreements, and drive

the Japanese out of Manchuria.

In seeking to propitiate China, and live up to its commitments for peace, Tokyo has invited discontent and revolution in Korea. So widespread is the dissatisfaction among Koreans of all classes over what they call the "weak-kneed policy" of their rulers toward the oppression of Korean farmers in Manchuria, that unless Tokyo makes a sudden change of front and stiffens its policy, it will lose the respect and allegiance of a people never fully reconciled to their absorption into the Japanese Empire. So we find Japan between the devil and the deep sea, facing the prospect of sacrificing the gains of her conciliatory diplomacy in China, of being pilloried in the world press as aggressively imperialistic and the certainty of impairing her prestige and power in Korea. The situation is loaded with dynamite and any further clashes between Koreans and Chinese arising out of land disputes in Manchuria may blow the

Morally, the Manchurian authorities are equally responsible before the bar of world opinion for creating antipathies that made the Korean outrages possible. If Japan should present a claim for damages arising out of the dispossession of Korean farmers in Manchuria together with other losses inflicted on Japanese subjects because of China's evasion of treaty agreements, the total would be much greater than the consolation indemnity she is now willing to pay for her lack of prevision in Korea. It goes without saying that any such claim for accrued damages would be rejected by the Chinese Government which refuses to be bound by the terms of a treaty which makes such a claim valid. Here again, Japan holds the wrong end of the stick. Her whole position in Manchuria from the Chinese standpoint is illegal, an aggression upon their sovereignty. She has no redress by process of law. In order to further placate China as well as to give effect to her own conception of fair-dealing, Japan will pay the consolation indemnity and in doing so invite a recurrence of incidents which cannot be altogether eliminated while the basic issue remains unsettled.

Japan's determination to force a peaceful solution of these problems without recourse to hostilities can be successful only if China abides by her agreements, validates the 1915 Treaty and co-operates wholeheartedly with Japan for the development of Manchuria and the advancement of their mutual interests in that region. In the event that this policy is rejected by China and it becomes necessary for Japan to safeguard her rights by other measures, the failure to preserve the peace will not be the fault of Tokyo. At all hazards, Japan will adhere to her policy of conciliation while remaining adamant in her determination not to yield one foot in surrendering her legal and acquired rights.

In view of Japan's inflexible resolution to stand pat on this issue, it would seem that discretion is the better part of valor, if China is to escape further humiliation at a time when she lies prostrate; torn asunder by civil warfare; menaced by Red armies from within and without; harried by bandits and hordes of hungry people; devastated by floods and famine and at her wits end to preserve some outward semblance of national dignity. For, it

may be stated on general grounds that despite the hysterical propaganda that fills the Chinese press about the secret ambitions of the Japanese military party to provoke an excuse for hostilities, that Japan is not seeking a war with a crippled neighbor in order to take advantage of its misfortunes. There is no glory, satisfaction or prestige in fighting an adversary who cannot hit back. Japan, like the United States and Great Britain, is more concerned with extending a helping hand to stricken China, than in kicking her when she is down and out.

The Chinese are prone to overlook that the much abused Japanese militarists could make little headway in influencing public opinion or the policies of their government unless they were supported by popular sentiment. The people of Japan as well as their Government responded immediately to the Korean riots, admitting their obligations, setting forth the steps to be taken to prevent further outrages and signifying their willingness to make adequate reparations to the Chinese victims. Japan went ahead fulfilling her promises, playing the game as it should be played, but China seized on the occasion to submit a group of stiff demands

supported by another boycott against Japanese goods.

In other words, China without waiting for a diplomatic solution, immediately declared war against Japan within the Kellogg-Briand Pact, using the economic weapon to enforce its viewpoint. Whether or not this boycott was sponsored by Nanking is beside the question. A very determined attempt was made by the Anti-Japanese Associations to repeat the tactics of the former boycott by confiscation of Japanese cargo, imposition of fines, punishment of Chinese merchants found with Japanese goods and other illegal methods to injure Japanese trade. When such associations arrogate to themselves the power to enforce regulations at variance with the law of the country, and the Government is unwilling or unable to intervene, it must accept full responsibility for its failure to discharge its ordinary functions.

Since the treaties for the renunciation of war as an instrument for the settlement of international disputes have become effective, the use of the economic weapon supersedes armed force in deciding the issue. China has appealed to this weapon on several occasions to enforce her diplomacy, until to-day it may fairly be said that she has renounced open warfare in favor of the more silent but equally disastrous method of inflicting damage upon those nations which from time to time incur her ill will, and in the majority of instances, the weapon has been used against Japan. The reaction of the Japanese people to these unwarranted and illegal activities has been one of deep resentment. Feeling has run very high especially amongst those leaders of finance and industry who exert

a powerful influence in the formulation of Japan's policies. At the Kyoto Conference of the Institute of Pacific Relations, Mr. M. Odagiri, Director of the Yokohama Specie Bank, one of the best informed Japanese delegates, presented a short, forceful paper on the use of the boycott by China to support her diplomacy. His remarks of two years ago, reveal that the Japanese business man is highly dissatisfied with a diplomacy that can find no solution to the continued application of the boycott by China to settle disputes with Japan. If war is to be condemned and outlawed, so also must the boycott be relegated to the limbo of forgotten things, if permanent peace is to be assured. It is a pity that Mr. Odagiri's statement did not receive more publicity in China, but when Mr. Matsuoka's presentation of Japan's case in Manchuria was totally ignored, it could not be expected that other questions conflicting with the Chinese viewpoint would receive any better treatment.

After Japan has demonstrated her sincere desire for an amicable compounding of her many outstanding disputes with China and is Willing to make all proper amends for the regrettable outrages in Korea and China responds with a series of stiff demands supported with a boycott and her leaders announce their intention of sending troops and war-ships to protect their nationals in Korea while other responsible officials seriously advocate going to war to punish Japan, and Generalissimo Chiang Kai-shek declares in a public speech that Japan has secretly supplied Canton with arms and ammunition, it is no surprise that the military party in Japan has been able to arouse public opinion in support of a strong policy. It is, however, significant of the broadmindedness of the present Cabinet that with the whole nation seething with indigation, it still looks with tolerance, sympathy and an unlimited willingness to bear with the faults of a distracted neighbor, whose very foundations as a state are crumbling away. The Cabinet in Tokyo refuses to throw overboard its conciliatory program to please the militarists and it may

go down to defeat and be overthrown by the opposition for its refusal to apply stronger measures to support its diplomacy.

There is, however, no immediate danger that the military chiefs will be able to impose their viewpoint, for Japan's final policy will be determined at the general conference scheduled to take place next month at Tokyo when Count Uchida and General Baron Ugaki will attend. In fact, the leaders of Japan realize that they have reached the stone wall, that no new treaty of amity or commerce can be negotiated with China until their status in Manchuria under the 1915 Treaty is recognized. It would be the height of folly on the part of China to refuse to recognize the seriousness of the situation, or to further inflame Japanese public opinion by bombastic utterances from responsible officials of the Government.

According to reports from Geneva, China is preparing her case in order to appeal to world opinion. Japan, will be outmanoeuvered and placed on the defensive by Chinese propaganda, and the real issue obscured by a multitude of minor incidents, arguments, deductions, conclusions and an appeal to principles that can all be summed up in seven words; "IS THE 1915 TREATY VALID OR INVALID?" China insists that it is invalid; that Japan has no legal rights in Manchuria; that she is there as the aggressor; that she must evacuate the Leased Territory, surrender her railway rights, withdraw her troops and get out. Japan stands squarely in the legality of the 1915 Treaty; refuses to sumbit it to arbitration and declares that if necessary she will uphold her position against the whole world.

THIS IS THE REAL ISSUE FROM WHICH ALL OTHER FACTS PROCEED

G. B. R.

China and Japan

(Continued from page 531).

recognize Japan's vital interests in Manchuria and to co-operate wholeheartedly with her for the development and defense of the key region to their joint security. Dr. Sun Yat-sen's dream of Sino-Japanese solidarity can be realized without humiliation or loss of prestige on the part of China, if Nanking and Mukden will face the realities and show a sincere desire to reach a working agreement based on the principle of co-existence, mutual dependence and joint responsibility for preservation of territorial integrity and national independence. China has a wonderful opportunity to join hands with her powerful neighbor and surmount all her political difficulties. On her attitude at this juncture hinges the fate of Manchuria and her own future as a nation.—G.B.R.

Coal from Asia

Anthracite coal is being brought to Canadian Atlantic ports in a ship from French Indo-China. That is a voyage half way around the world. A vessel now unloading in Philadelphia is discharging 1,000,000 feet of fir and hemlock from Oregon and Washington and a quantity of canned goods, dried fruits and petroleum base products, and will take back to the Pacific Coast steel, automobiles, asbestos, machinery and tools.

The economic answer regarding the lumber ship from the West Coast is not hard to find. The ship belongs to a lumber concern. Its general cargoes are "velvet"—added profit in connection with its lumber transportation. The whole operation produces remarkably cheap ocean-freight rates for the lumbermen interested—so cheap that the lumber can be sent hundreds of miles inland by rail.

But why coal for Canada from the Orient? We think of Canada as our next-door neighbor, and it is. And we think of Pennsylvania as the greatest hard-coal producing area in the world, which it is. The Norwegian vessel just chartered to bring to Eastern Canada 4,000 tons of anthracite coal from mines in French Indo-China will make a voyage many times the distances between Philadelphia and the average Canadian port. As an item of competition for American miners, 4,000 tens sold by Indo-China mineowners to Canada is apparently not large. Yet the fact remains that somebody has sold our next-door neighbor about the same kind of coal as Pennsylvania's anthracite and contracted to bring it from the other side of the world.

The Validity of A Treaty

The Background and Realities of the Manchurian Problem BY GEO. BRONSON REA.

FOREWORD: The foregoing articles on Extraterritoriality and the basic issues between China and Japan were written and on the press by September 19, before the Japanese military authorities in Manchuria precipitated the crisis that has resulted in their occupation of Mukden and other strategic points in Manchuria. The real issue between China and Japan is the validity of the 1915 Treaty, which China refuses to recognize on the grounds that it was extracted under duress. In the following article an effort is made to present the outstanding points of a dispute that has accentuated ill-feeling in both countries.

of peace was signed at Shimonoseki on April 17, 1895, in which China recognized definitely the full independence of Korea and ceded to Japan in perpetuity and full sovereignty, the southern portion of the Province of Fengtien and all islands belong-

ing to that province.

Considering that permanent possession of the ceded territory by Japan would be detrimental to the lasting peace of the Orient, Russia, Germany and France, united in a joint recommendation that Japan refrain from holding these districts permanently. The then three strongest military Powers of Europe forced Japan to surrender the legitimate fruits of her victory and accept in lieu of territory, a paltry cash indemnity of Taels 30,000,000. Unable to fight against such overwhelming odds, Japan bowed to superior force and in an Imperial Proclamation dated May 10, 1895, the Emperor accepted the recommendation of the Three Powers and in a formal convention dated November 8, 1895, returned the ceded territory to China. Japan was compelled under duress to hand back Fengtien to China.

In May 1896, still smarting under the humiliation of his defeat the year before and grateful for Russia's intervention, Li Hungchang entered into a secret offensive and defensive military alliance with Russia aimed at Japan. In order to carry out the objects of the alliance, and facilitate the access of the Russian land troops to the menaced points (on the Korean border) and to assure their means of subsistence, China ceded to Russia the right to build a railway line across the provinces of Heilungkiang and Kirin, in the direction of Vladivostok. This Master Treaty was maintained a profound secret. In fact, its official text was not revealed until 1921, twenty-five

years later.

On September 8, 1896, the above secret or master treaty was implemented by signing the commercial convention for the construction and operation of the Chinese Eastern Railway. On March 27, 1898, China leased to Russia for the term of 25 years the Liaotung Peninsula and conceded the right to extend the Chinese Eastern Railway from Harbin to Port Arthur. The terms of the secret alliance having been complied with by China, the Russians occupied and flooded Manchuria with troops, closed the province to foreign trade and travel and converted it into a viceroyalty ruled from St. Petersburg. *Manchuria became a Russian province*.

The Russo-Japanese War followed. Japan again emerged victorious from the conflict. At the Portsmouth Peace Conference, Russia refused to pay a cash indemnity but with the consent of China transferred to Japan the Liaotung Lease and her rights to the South Manchuria Railway. The railway had been destroyed by the retreating Russian armies and the advancing Japanese laid down a light narrow gauge military line to transport their troops and war material. Japan fell heir to a right of way and a road bed.

Japan then borrowed the money in England to rebuild the South Manchuria line and poured her own capital into the province in order to develop its resources. By 1910, however, it became apparent that the short unexpired term of the lease made impossible any further borrowing of capital for Manchurian development. Unless the extension of the lease could be assured, Japan stood to lose the picayune fruits of her victory over Russia and the capital she had invested in the development of Manchuria. Perhaps this will help to explain why Japan chose the first favorable opportunity to solidify her position in Manchuria.

In February 1915, Japan presented Twenty-one Demands to China and in the subsequent negotiations, the Chinese willingly agreed to accept those concerning Manchuria and Shantung, but rejected the rest. Japan, at the request of China, then presented an ultimatum and as a result, China signed a treaty on May 25, 1915, extending the Liaotung Lease and the terms of the South Manchuria Railway and the Antung Railway to 99 years. The treaty also conceded to Japanese subjects the right by negotiation to lease land for erecting suitable buildings for trade and manufacture and for agricultural enterprises.

This treaty is now the crux of the Manchurian problem. The Chinese, appealing to the higher moralities, contend that it was extracted under duress and therefore invalid. Volumes have been written on the Manchurian problem, from both the Chinese and Japanese viewpoints, but there is one aspect of the dispute that seems to have been ignored. Two wrongs cannot make a right, but it is a good rule that works both ways. If Japan was compelled by force majeure to restore to China the southern part of Fengtien Province, after China had ceded it in perpetuity to Japan, then it would seem that the formal convention of November 8, 1895, under which the retrocession was made, is also invalid. At least, the principle involved is identical. If therefore, we view the Manchurian problem from this angle, it would appear that Japan simply awaited a favorable opportunity to repay China in her own coin, employing the same methods to recover a prize that had been

wrested from her by superior force.

Whatever may be the legal or moral aspects of such a case, it is not difficult to analyze and understand its psychological repercussions on a nation of proud fighting men deprived of the legitmate fruits of victory by a combination of outside military Powers. To this humiliation was added the further affront of seeing China make a present of the restored territory to Russia under the terms of a secret alliance aimed at Japan. After a second war made possible by this alliance, Japan again emerged victorious, and once more came into possession of a part of the territory she surrendered in 1895, only instead of an outright cession in perpetuity, her acquisition was restricted to the unexpired portion of a twenty-five year lease. It soon became apparent that Japan could go so far and no further with the development of Manchuria under these conditions, and to solidify her position and assure some returns on her vast expenditure, she approached China for a promise to extend the Liaotung Lease before its expiration. China declined to commit herself. Japan in due course presented her Demands and obtained the treaty which consolidated her position. It is useless to hazard an opinion as to the rights and wrongs of a case with such a background.

China refuses to discuss what had gone before, takes her stand upon the injustice and illegality of the Twenty-one Demands and says, in effect, that the rule works only one way, and in her favor. At the Versailles Conference, China fought to have the 1915 Treaties brought up for discussion as part of the World Peace negotiations, and had it not been that France, England and Italy had secretly promised to support Japan, she would have won her point. At the Washington Conference for the Limitation of Naval Armaments, China raised the issue of the validity of the 1915 Treaty, and again was doomed to disappointment, as Japan attended the conference only on condition that her rights in Manchuria should not be brought up for discussion. China made a splendid presentation of her case, clearly explaining her reasons for refusing to recognize the validity of the Treaty. When her efforts to have the Manchurian issue adjudicated by the Conference failed, she reserved the right to seek a solution on all future appropriate occasions.

Japan's position as defined at Washington is based squarely on the legalities. In stating Japan's case, Baron Shidehara said: "if it should once be recognized that rights solemnly granted by treaty may be revoked at any time on the ground that they were exist.

conceded against the spontaneous will of the granter, an exceedingly dangerous precedent would be established with far-reaching consequences upon the stability of the existing international relations in

Asia, in Europe and everywhere."

In response to the invitation of Secretary Hughes calling upon the delegates to produce and file with the Conference copies of all treaties, secret and otherwise with China, the Chinese submitted a telegraphic summary of their 1896 secret treaty of Alliance with Russia; the first official confirmation that the Treaty actually existed.

The Japanese Delegation at once realized the tremendous bearing of this document on their whole position in Manchuria, but wisely refrained from making any open comment that might provoke a dscussion at the Conference. In the interests of harmony and to avoid outside interference in a dispute that was peculiarly one that concerned only the two interested parties, the Japanese Delegation preferred to stand on the legality of the 1915 treaty, stating in explanation that any research, re-examination or discussion of old grievances at the Conference, would serve no useful purpose. The Japanese Delegates realized that if the 1915 Treaty was brought up for discussion and declared invalid, then their rights in Manchuria were defined by the Portsmouth Treaty, and in view of the evidence submitted by China of her share in making the war possible, she was liable for any indemnity that they might demand. In view also of China's declared intention to seek a solution to the 1915 treaty on all future appropriate occasions, a solution that would have to be arrived at in amicable negotiations with Japan, without the intervention of a third Power, the Japanese Delegation diplomatically abstained from provoking a discussion at Washington that would probably have reopened the whole case before an international court. If China has to confront Japan alone and insists that the 1915 Treaty is invalid, Japan can then take her case back to Portsmouth and exact the indemnity she feels she is fairly entitled to by reason of China's secret alliance with Russia.

The attitude of the Japanese Delegation at Washington in refraining from any open comment or discussion and keeping their own counsel when Secretary Hughes read in open session the abridged text of the Li-Lobanoff secret treaty of alliance of 1896, is a most remarkable example of self control under severe provocation, characteristic of the code of the Samurai. For, had the Japanese so desired, they could have wrecked the Conference then and there by demanding a re-opening of the whole Manchurian case based on China's confession and offering the Sino-Russian secret alliance as the offset and justification for the subsequent Anglo-Japanese Alliance which at that particular moment was being assailed in the Conference as the most iniquitous, most aggressive and intolerable pact of modern history; the cause of all of China's woes and inability to set her house in order. Japan's self control saved the conference and the peace of the Pacific and as China reserved to herself the right to seek a solution of the Manchurian question on all future appropriate occasions, Japan similarly reserved the right to hold China responsible for the consequences.

The original twenty-five year lease to the Liaotung Peninsula, expired in 1923. In conformity with her declaration to ignore the 1915 treaty as illegal, China formally notified Japan of the termination of the lease, and requested the restoration of her sovereignty

over the territory. Japan categorically declined to discuss the

matter.

If the Chinese contention is upheld, then Japan is in Manchuria as an aggressor, forcibly occupying territory that belongs to China. From the Chinese viewpoint, there are no extenuating circumstances. They reject the suggestion that they are in any way indebted to Japan for driving Russia out of South Manchuria; or that they were in any way responsible for the war itself. They declare the lease expired in 1923, that the railway rights expire in 1934, and they want Japan to get out, withdraw her troops and place her industries

and activities under Chinese jurisdiction.

The general treaty of commerce between China and Japan, which amongst other things extends extraterritorial privileges to Japanese subjects, has expired. For several months past, negotiations for a new treaty have been in progress. Japan apparently is willing to surrender all special privileges, extraterritorial rights and concessions in China proper in return for the reciprocal rights for her subjects to reside in the interior, to own and lease land, erect buildings and engage in business and industry. Standing pat on her declared policy of not recognizing the 1915 treaty, China says that Japan cannot enjoy these privileges until she surrenders the Liao-

tung Lease, and withdraws her troops from Manchuria. Japan's whole position in Manchuria, her investment of a billion and a half yen, her economic necessities, strategic security, national honor and dignity all rest upon the legality of the 1915 Treaty. To surrender this treaty is equivalent to committing national suicide. So here is the real issue that awaits solution. Until the deadlock is broken, it is clear that no treaty of commerce and amity can be negotiated between China and Japan. The Nakamura case, the Wanpaoshan affair, the massacres in Korea, and the three hundred or more other incidents which complicate and embitter relations between the two nations, all proceed from China's refusal to recognize the 1915 Treaty as binding.

Both sides have been facing a stone wall. Confiding in the League, the Kellogg Peace Pact and world sympathy to restrain Japan from employing armed force to support her diplomacy, China has settled down to a determined siege to undermine Japan's position through economic pressure. China has ignored the solemn declarations of Japan that she would brook no outside interference in Manchuria, that she would fight the whole world if necessary, to preserve her hard won rights in that region. China, also, has overlooked the essential fact that even in the Kellogg-Briand Peace Pact, several signatories reserved the right of self defense and defense of regions where they have vital interests. Under these conditions a crisis was inevitable. Some incident had to break a deadlock that was slowly but surely tightening the noose around Japan's neck. Japan had to move in Manchuria as Britain has moved in India and in Egypt, as the United States has moved in the Carribean and as France moved in Morocco. It is not a question of policies, party politics or individual persons. It is a question of the destiny of a nation, the instinct of life and self preservation which sooner or later sweeps policies and persons out of the way and asserts its right to

It makes little difference in the long run as to the precise incident that breaks the deadlock. It may or may not be justified. It may have been premeditated or accidental. The Japanese army officers in Manchuria inflamed over the Nakamura case, may have deliberately manufactured a pretext to start hostilities. It is too early to determine responsibility for the incident at Mukden. Somebody dropped the match in the powder magazine. Something started the Japanese armies moving and we face the accomplished fact.

The world will hear a lot about Japan's imperialistic designs upon China. We will be told how the military party in Japan has forced the showdown. Attempts will be made to compare the Japanese military machine with the Prussian military despotism that ruled Germany. Before jumping to hasty conclusions, it would be well to recall the historical background of the Manchurian problem and the reaction of any group of fighting men to the several instances when they have been compelled to forego the legitimate fruits of victory by duress from the outside and by international interference. To past history, is added the present situation in Manchuria, where the victors of two wars again see themselves being deprived of the fruits of their victories, by the operation of peace pacts and other instruments for the renunciation of war.

China's sovereignty over Manchuria is not disputed, even by Japan, but the question might be asked as to whether China has exercised her sovereignty rights wisely and well; has she faithfully discharged her international obligations in a strategic region that stands as the buffer between two great and powerful states with conflicting social systems, political ideals and territorial ambitions? Has she made any move to recover her lost sovereignty over Mongolia or check the encroachments and activities of the Soviet in the borderlands of Manchuria? Has she striven to advance the welfare of the people of Manchuria, contributed to the maintenance of law, order and stability or made any effort to protect the huge investment of outside capital that laid the

The picture of Manchuria to-day is perhaps the most sordid example of the abuse of power in contemporaneous history. At the outset, Japanese capital to the extent of a billion and a half yen, supported by their initiative and enterprise, developed its resources and industries to a high degree of efficiency, service and profitableness, creating for its Chinese rulers seemingly inexhaustible sources of new wealth and revenues. In order to divert this wealth into the pockets of its overlords, the people of the Three Eastern Provinces have been systematically despoiled of the fruits of their labor over a period of years until the once prosperous and

contented region is now facing ruin. Nearly seven billion dollars in incontrovertible, worthless paper notes have been forced on the farmers in exchange for their cash crops which were then sold for the gold that has, in the main, paid for the upkeep of the huge armies, prosecute wars of conquest, and enriched the higher officials.

As a corollary to this impoverishment of the region, Japan's investments have dwindled in value and to the point where they are no longer profitable. It is only a question of time when their value will disappear. Defeated economically by the operation of a system and policies designed to drive her out of Manchuria, Japan's juridical rights and strategical position also becomes

valueless and without a raison d'etre.

Japan sees the handwriting on the wall and her military leaders have appealed to the right of self defense. The world now faces the accomplished fact. China must confront Japan alone for the settlement of an issue that for the last sixteen years has unsettled the peace of the Far East, thwarted the natural development of Manchuria, made possible the independence of Mongolia, and the advances of Soviet influence throughout the border lands of Manchuria and North China. Nanking has appealed officially to the League and unofficially to the Government and people of the United States who sponsored the Kellogg Pact to exercise their influence of leadership in the cause of international peace. Her appeals to the League are met by Japan's declaration that she will brook no interference in her dispute over Manchuria, and the League can do little more than send a commission to inquire into the events of the night of September 19. If Japan should be coerced into submitting her case to the arbitration of the League, thus once more inviting international duress to deprive her of the fruits of her war victories, China's diplomatic triumph would be complete.

But with America outside the League, it is difficult to believe that Great Britain, France or Italy would vote to coerce Japan into surrendering a treaty right that they secretly agreed to support at Versailles as part of Japan's compensation for participating in the War. Such a breach of faith would kill the League and

pave the way for the final overthrow of the Peace Pact.

China's appeal to the United States loses considerable of its sincerity and force when it declares that "if such an aggression as Japan's unprovoked invasion of the territory of a friendly nation can pass unchallenged by the enlightened opinion of the world, then the human race faces the prospect of annihilation through wars of conquest precipitated by the greed of imperialistic governments." A little of that same consideration for their own people who have been annihilated by the wars of conquest waged for fifteen years by the greed of their own predatory militarists, would be more effective, than this solicitude for the human race at large. China has a strong moral case, but Japan has also a case based on the realities that will be difficult to set aside by an appeal to sentiment. Japan, as usual, has refrained from talking or explaining the immediate causes which started her Manchurian armies marching. The Chinese contend that her invasion of Manchuria was a studied and deliberate violation of the letter and spirit of the Kellogg Pact, but if Japan replies that she acted in self defense and for the defense of a region where she has vital interests, the Kellogg pact cannot be invoked to compel a settlement of the dispute. International law is the creature of international custom and force will continue to play its part in solving problems not susceptible of adjudication by amicable compounding The stronger nation will make and enforce its own laws to defend itself against any menace, real or imaginary, which endangers its existence.

A nation which cannot solve its own internal problems by compromise, arbitration, appeal to reason or patriotism, and which for two decades has resorted to the sword to settle its own political disputes while rejecting all outside offers to mediate, is placed in a most awkward position when it denounces another nation for employing the same methods to compel the settlement of a long drawn out dispute whose liquidation now becomes imperative for its security and existence.

China has steadfastly opposed any foreign intervention or mediation to bring about a peaceful conclusion to the protracted series of senseless and useless devastating wars for power and plunder which have doomed untold millions of her unfortunate and inarticulate people to misery, starvation, slavery and death, bankrupted her treasury; sapped her resources, halted her development, destroyed her trade and in general brought ruin upon herself and her friends.

China has reserved to herself the right to wage war in her own way to support her diplomacy against any and all nations which incur her ill-will. Renouncing the use of force she has appealed to the boycott weapon, economic pressure, labor agitations, general strikes, interference with shipping, confiscation of cargoes, penalization, imprisonment, punishment and even summary execution of those "traitors" who maintain business relations with the "enemy." There has been no effective way to combat this conception of warfare and Japan in particular has been forced to remain quiescent in the face of repeated provocations, and campaigns confessedly launched to accomplish her economic ruin.

Standing upon her rights as a sovereign state, member of the League, the Hague Court and signatory to the Kellogg Pact, China qualifies any outside offer of mediation to end her own catastrophic wars as an infringement of her sovereignty, but demands immediate intervention and assistance in any dispute with an outside power, which wearying of her procrastination resorts to

force to compel a settlement.

Japan's sword has cut the Gordian knot of how, when and in what manner, a nation can defend itself against a system of warfare not recognized by international custom or law. If her action in Manchuria does nothing else it will bring this question forcibly before the world and compel a modification of the accepted theories of international law, covering the use of the boycott as an instrument of warfare. Here, again, China or the other Pacific Powers cannot say they were not warned in time. One of the foremost spokesmen for Japan brought this question up at the Kyoto Conference as one of the most important subjects for consideration, but there was no time for its discussion. Mr. Odagiri clearly explained Japan's position when he said that "the continued application of the boycott as an instrument to settle international disputes is highly provacative and unjust . . . if war is to be condemned as an instrument of national policy, so also must the boycott be outlawed!" On top of this clear cut declaration of Japan's position regarding the use of the economic weapon, China again declared an economic war against Japan over the Korean massacres. With no redress under international law, Japan has defended herself by force, and planted squarely the issue before the world.

If Japan's forcible occupation of Manchuria jars China into a realization of her helplessness and brings about a belated unification of all parties and factions under some form of centralized or federalized government, it will have conferred a blessing on the great masses of peaceful Chinese people who have paid the price in untold suffering for the slight boon of peace and stability.

It is a sad commentary on the patriotism of a people when the greatest flood calamity recorded in history causing the death of millions by drowning, starvation and disease could not bring their warring leaders together in order to relieve the sufferings of their own people. With bumper crops of cereals in Manchuria sufficient to feed from the surplus all the starving people in the Yangtsze; with a system of government owned railways that could deliver this food to Hankow within three days, Nanking has been compelled to seek her relief wheat in the United States, pay for it at current market rates with borrowed money, mill it into flour and ship it in foreign bottoms across the Pacific and up the River to the flooded districts. The Chinese officials who control the cereal crops in Manchuria bought from the farmer with worthless paper notes, have shown no disposition to answer the call of humanity, of nationalism, of patriotism, or the appeals to their charity and save the lives of their fellow countrymen in the South.

What could not be brought about in any other way has been forced by the action of Japan. Canton, Nanking, Peking, Mukden, Chengtu will now sink their differences, close their ranks and pull together for the salvation of the nation. Chiang Kai-shek once more becomes the man of the hour, the leader of a united country, declaring that he will lead the armies of China in person and fight for the preservation of the race, and, if need be fall in battle with his soldiers. Japan's threat has accomplished in three days what war, famine, pestilence, flood, devastation and poverty from within and continued pressure from without has been unable to do for twenty years. Not until their country is menaced with partition have the Chinese military leaders shown the slightest disposition to bury the hatchet and unite for the defense of their common interests. It is a pity, a humiliation even for a foreign observer to have to chronicle (Continued on page 539).

Digging Its Own Grave

The League and China

Nations to examine the situation created by the Japanese move in Manchuria and to intervene for the settlement of a dispute which, in the last analysis, has its origins in her refusal to admit the legality of a treaty extracted under duress.

Japan served notice at Washington that the Manchurian question was one, "to be taken up between Japan and China, if it were to be taken up at all, and not at this Conference." Tokyo again announces that it will not permit the League or any third

party to mediate or intervene in the dispute.

On the other hand, if the League incautiously admits that the dispute comes under its jurisdiction, it digs its own grave. If revision of a treaty extracted under duress is once admitted as coming within the scope of the League's activities, Germany and other states suffering under the provisions of the Versailles Treaty will also demand its revision. Any tampering with the war settlement, for the enforcement of which the League was created and whose covenant is part of the Treaty itself, will result in undermining the whole edifice of the Peace and bury the League in its ruins.

The picture presented is illuminating and instructive. At Versailles, China refused to sign the Peace Treaty with Germany because of the Shantung Clause and her unwillingness to recognize the validity of the 1915 treaties. She did her best to break the Versailles treaty in the American Senate and in so doing helped to keep America out of the League. China then signed the Austrian Treaty and became a full-fledged member of the League and

is now represented on its Council.

Twelve years later, with the United States still outside the League, China again faces a crisis arising out of the identical dispute which crippled the League at its birth. China now appeals to this disabled body for an assistance that if rendered will finish its usefulness!

The Mills of the Gods grind slowly but they grind exceedingly small. If the League should now intervene in the dispute between China and Japan and thereby create a precedent for the revision of the Peace Pact, historians of the future will chronicle that the World War was fought for the benefit of a nation forced from the outside under threats of a civil war, to take sides in an issue it was not interested in and with no concern in the outcome other than gaining a diplomatic victory over an immediate neighbor.

China's refusal to sign the Peace to end all future wars because of her dispute with Japan may precipitate another conflict completing her own downfall and unless localized, another world

catastrophe.

Or, if China succeeds in forcing the League to intervene in the Manchurian dispute and it leads up as it inevitably must, to the consideration of the validity of the 1915 Treaty, then the League is finished. Once the precedent is established that a treaty extracted under duress comes under the purview of the League for revision or annulment, the League will do down to oblivion in the fight that will be initiated by Germany and other states to compel a revision of the Versailles Pact. And, when that Pact is impaired and undermined, the reparations will also go and the United States will be left holding the bag, paying for a war whose origins are lost in the dim pages of European history and with which we were not concerned until dragged in to defend our rights as a neutral.—G.B.R.

Publicity for American Ships

been very generous in taxing themselves in order to assist struggling domestic industries to hold their own against foreign competition. Three years ago, American shipbuilding was practically dead. Eighty-five per cent of our yards were empty. To-day these yards are all active, giving employment to an army of workmen and indirectly contributing to the prosperity of every state in the Union.

The Jones-White Act of 1928, authorized liberal construction loans from Government funds up to 75 per cent of the cost at low rates of interest in order to encourage the building of new and modern ships in addition to long term contracts with the operators for carrying the mails. As a result of this constructive and farreaching legislation nearly fifty new and up-to-date ships aggregating more than 400,000 gross tons and costing nearly \$200,000,000 have been contracted for in American yards. There are still twenty or more big liners to be built which will increase the total gross tonnage to 800,000 in the next few years.

The above fleet includes two new palatial passenger ships for the Pacific trade whose operation has been entrusted to the Robert Dollar Company to make them earn a profit and repay their con-

struction costs to the Treasury.

Seventy-five per cent of the capital investment in these new vessels belongs to the American people and it is up to them to determine whether their cheerfully assumed burden of taxation is to be returned to them or written off as a present to operating companies and their financial backers. These American ships, the last word in comfort, luxury, safety, speed and marine engineering are ready to serve the nation. Their fate rests with the American travelling public and shippers of American cargo. American shipping on the Pacific has to meet the most determined and skilled competition, not only from British and Japanese, but other cheaply operated European cargo carriers. These new vessels enter the competition in the midst of the worst depression in history; launch-

ed into service on a wave of optimism that can hardly be justified by present conditions. Passenger traffic is at its lowest ebb and shows no signs of immediate improvement. Our new American ships must seek the bulk of their passenger traffic from their own stockholders; the American business man, the tourist and the missionary.

If our new experiment in protective legislation is to benefit the national economy we must concentrate all our energies in filling these vessels with cargoes, in order to offset the inadequate returns from the passenger end. To succeed in this, there must be an entirely new conception of national co-operation. It is not enough that the government hands out its millions to build the ships that will carry the cargoes, and let the matter end at that point. The whole scheme and idea of American steamship publicity must be revised and brought under intelligent control instead of being left to local passenger agents whose sole conception of the value of advertising is to fill their allotted state rooms with passengers.

The up-to-date cargo storage and handling facilities of our new merchant marine, with their refrigerating holds, specie strong rooms, silk compartments, and divisions for other valuable and special freight, overshadow in earning power and importance, the more spectacular passenger accommodations. On whether these holds are filled with profitable freight or not, depends the outcome of our experiment in building a national mercantile marine, and to make this venture the success it ought to be, there must be a complete

revolution in our publicity methods.

In the March, 1931, number of the Merchant Marine Bulletin, its Editor, Mr. W. Harry King, in a forceful editorial on this subject said: "If all of these ships were controlled in one private business corporation, one of the first things inaugurated would be a high class and efficient publicity bureau to place before the public the advantages to be derived from patronage of its fleet of vessels".... Expenses of such an effort should be contributed by every American shipping company engaged in foreign trade and by the Government

itself.... If such a publicity effort is made, it should be a sustained one, backed by systematic and regular contributions from the companies interested and by the Government itself, as the moncy of the United States is involved in such an undertaking. There should be a small committee appointed representing the larger branches of the industry and the Government. This committee should dictate the type of publicity to be issued and in a general way have charge of the distribution and expenditures of all the moneys to be raised for this purpose! "Mr. King concludes by pointing out that we are now carrying approximately but one-third of our own foreign commerce and if we can succeed by this publicity campaign in keeping 51 per cent in our own midst, we will not only be carrying out the express policy of Congress, but will be adding greatly to our own industries and to the means for our national defense, for every merchant vessel is now of increasing importance since the further limitation of naval armament has become effective."

Mr. King is right, our only comment being that he has confined the scope of his publicity efforts to the United States. Mr. King senses the essential truth that the real returns on our national investment must be derived from carrying our own goods, and making every effort to assure return cargoes. A publicity campaign along these lines, to be successful, means something more than sending out a group of speakers to educate our own businessmens' associations. It means a complete revolution in the antiquated system of steamship advertising, concerned solely with suites de luxe and other superior passenger accommodations which only the wealthy can afford to pay for.

The advantages of shipping American goods on American vessels, should be brought home to the manufacturer by advertisements in his favorite trade journals, where it will stare him in the face every time he opens it seeking the latest notes on new contracts and business opportunities abroad. The covers of the Commerce Reports which reach everybody interested in foreign trade might

be used with profit in such a campaign.

In any publicity campaign for the support of American ships, consideration should be extended to American publications in foreign countries especially those which have carried the brunt of the fight and paved the way for our commercial expansion, reflect American ideals and policies and defend our interests when they are endangered. The American people look across the Pacific to the countries of Asia as one of the greatest potential outlets for the expansion of their trade. They have made possible through the enactment of special legislation the creation of a merchant marine fleet to obtain their share of this trade, which means cargoes and not passengers. To fill these ships with American cargoes we must increase the volume of American goods sold in the Orient, and a very important rôle in our national sales organization in creating this demand, is the bona-fide American newspaper and trade magazine published on the ground.

Chairman O'Connor appeals to the nation to support its ships. The appeal reaches Americans in the Far East who have a direct

interest in the success of our experiment. These American ships must be filled with cargo coming and going, if our foreign commerce is to expand and provide employment for our people. The im. portance of this phase of our national activities cannot be over. estimated. Although foreign commerce represents at present only ten per cent of our total business, in money value it amounts to nearly ten billion dollars annually, giving employment to several millions of people. Due to many causes Americans can compete effectively with other nations on the high seas, only if they use American methods—if they have the best possible ships, equipped with the best possible machinery and manned by the highest type of workers. The American people through their Government has voted the funds to build the ships and the American shipbuilder and engineer have done their part in making success possible. They have turned over to the operators, vessels equipped with the most up-to-date machinery and labor-saving devices. Our future on the high seas, is now in the hands of the operators. If they are to succeed with their end of the experiment an entirely new system of national trade promotion publicity and propaganda must be devised and put into practice. We cannot afford any more gambling with the nation's credit. The stake is too high; the risks too great. Mr. King's suggestion for centralizing publicity for American ships under a committee attached to the Shipping Board is constructive, but the idea should be carried still further. American manufacturers interested in foreign trade should support national organs published abroad for the advancement and defense of their interests, and this support might also be supervised by a general trade promotion committee attached to the Department of Commerce, the U.S. Shipping Board or the Chamber of Commerce of the United States.

The time has arrived when the formulation of national trade promotion policies and programs should be controlled by a national committee that can supervise intelligently all foreign trade publicity. Our competitors are gradually working towards this end.

At least three countries have associations of advertisers, which scrutinize carefully all foreign publications which carry national advertising to see that their manufacturers and national interests receive fair play in editorial publicity; in effect, a thinly disguised governmental control over foreign publicity expenditures at the source.

Something like this will have to be done by American industry, if we hope to succeed in the competition for world markets. National support to national publicity organs is just as essential to national success in expanding foreign trade as are national contributions to build a national mercantile marine. The national newspaper or magazine that carries the brunt of the fight to uphold national prestige and dignity and promote those relations which make for closer trade ties, has a claim to the support of the American government equal to the industrialist, shipbuilder or ship operator. It is part of the system, an indispensible cog in the machinery of world trade.

Japanese Bid for Railway Equipment Orders

Afghanistan had entered into a contract with a German syndicate for the financing, construction, equipment and operation of a net-work of new railways connecting the capital with the north, south and western borders. There has been no further information released for publication about the progress of this important development project, but a Reuter dispatch from Tokyo dated September 14, informs us that:—

"The Government of Afghanistan has approached Japan in regard to the question of supplying railway engineers to assist in the construction of a 1,000 mile railway line which

Afghanistan is proposing to build.

It is understood that the proposal came through the Japanese Minister to Persia, who was informally approached, as Japan has no diplomatic representative in Afghanistan.

Afghanistan's request follows the employment of Japanese railway engineers by the Soviet and Persia, both of whom are stated to have been well satisfied with the results.

It is understood that the Railway Department is now discussing the Afghan proposal. Meantime it is reported that the Afghans are seeking to persuade Japan to invest Y50,000,000

in the proposed enterprise."

This would indicate that something has happened to invalidate the reported German concession and that Afghanistan has turned to Japan for help in her development plans. This is another feather in Japan's cap, a further recognition of her tremendous advances in railway technique. The group of Japanese experts who went to Russia last year to educate the Soviet railway engineers in their methods of rolling stock repair, will complete their mission this month. So successfully have they carried on their work that the

Soviet authorities are contemplating the extension of the term. They have placed an order in Japan for Y.300,000 worth of wheels and other railway accessories. It is also reported that the Japanese banks with Government approval will advance long term credits amounting to Y.50,000,000 to enable Russia to purchase engineering equipment from Japanese manufacturers, which include electrical machinery and apparatus, new ships, motors for ships, tin plate, machine tools, pumps and pipes for oil fields, railway material, dredging machinery and equipment for harbor improvements, mining machinery, copper and chemical products.

It is interesting to note that the Japanese steel mills and rolling stock manufacturers are making every effort to expand their export markets. Last year by co-ordination and co-operation all along the line, Mitsui & Company submitted tenders, which won for Japanese steel makers an important bridge order in Siam. This has been followed by another important Siamese order for steel obtained in open competition with world's steel makers. The Japanese bid was successful against some forty competitors of Belgian, Czecho-Slovakian, French, German, American and British nationality. The contract is for the supply of five hundred tons of steel for new construction and replacement-plate girders, lattice girders, culverts, etc. Mitsui's bid was not less than Yen 100 per ton delivered in Bangkok. A German bid was second lowest. American bids were highest.

The Government steel works at Yawata will supply the steel to Japanese Government railway specifications, which are severe.

While there will be but small profit in this, the first Japanese contract to a foeign government, it will be of high advertising value. Commenting on this order, The Engineer of London remarks that:

"The Siamese deal will be so handled as to enhance the reputation of the island empire of the east, which is making a name for itself in a department of activity hitherto confined to a few Western nations, whose one-time monopoly in so

many branches of engineering is now at an end."

That Japan is determined to make a bid for a share in the world's steel trade is evidenced in many ways. Large stocks of certain shapes are maintained in China, to be marketed by the Mitsui and Mitsubishi organizations. Last year these sales totalled over 40,000 tons. Japanese rolling stock manufacturers have been successful in securing important orders from the Kiao-Tsi Railway (Shantung) and from several Chinese lines in Manchuria. A bridge contract in the Philippines has also been awarded to Japan.

Japan is making strenuous efforts to gain a foothold in other foreign markets, notably in Egypt and South Africa, quoting prices slightly below "Irma," the European Rail Cartel. European producers, members of the Cartel, have been complaining about this heavy competition on the part of the Yawata Combine, but with their own neighbors unloading their over subsidized steel products and heavy engineering equipment on the world markets, it is difficult to find just grounds for criticizing Japan for doing

likewise.

"American Foreign Trade in 1931" Assails Profitless Merchandising

"AMERICAN Foreign Trade in 1931," the annual report on international trade of the National Foreign Trade Council, emphasizes the paramount need to "stop profitless merchandising" as the first requisite to recovery. The Council calls attention to the fact that although wholesale commodity prices in the United States have been reduced by an average of 11 per cent per month during the past two years, that reduction is now proceeding at a rate of slightly less than one-half of one per cent per month, with the strongly marked indication that the trend of American trade may presently return to stable prices and a resumption of rising values.

Although falling prices are common to all parts of the world, James A. Farrell, Chairman of the National Foreign Trade Council, in interpreting the world trade outlook, declares that "the stabilization of our domestic market will have a strong constructive

influence in other countries."

The single resolution passed by the Foreign Trade Convention in New York last May calling on American business to "stop profitless merchandising" has been circulated during the past two months, the report states, throughout every industry in the United States. Trade associations, bankers, manufacturers, advertising agencies, steamship and railroad companies, and other endorsers of the resolution have broadcast approximately 200,000 copies of the foreign traders' declaration. This strong movement against the inertia caused by falling prices is having a very sound effect, the Council declares, on the present trade situation.

The report also contains an analysis of the present Latin American economic situation by Dr. E. W. Kemmerer, Research Professor in International Finance at Princeton University, whose

conclusions are summarized as follows:

"For a number of years preceding the present crisis, Latin American countries borrowed very heavily in the American market. The American public was prosperous and it seemed to be willing to buy Latin American bonds in almost unlimited quantities under the pressure of the high-powered salesmen of American investment houses. * * * * Many of these countries are making great sacrifices to maintain the service charges on their public debt, under very unfavorable conditions—conditions for which they themselves, for the most part, are not responsible. Most of them are succeeding in their efforts, and they deserve hearty co-operation and support."

The most outspoken session of the convention, the frank discussion accorded the American tariff by the importers, and the rejoinder by Dr. Julius Klein, Assistant Secretary of Commerce, brings this highly controversial subject for the first time into the record of one of these gatherings. The nineteen sessions of the convention heard 51 addresses on various phases of the foreign trade situation, and comprise the most comprehensive record of the foreign

trade situation which the Council has issued in recent years. A new feature of the convention was a series of "foreign trade appraisal" luncheons in which nine first-line industries sent their leading spokesmen to a "convention within a convention."

The three-day session was attended by 1,567 delegates from 35 states and territories of the Union and 24 foreign countries, and was the largest meeting the Council has held in the east, excepting

that in Baltimore two years ago.

The report is provided with a 16-page index for ready reference and contains a verbatim record of the group sessions held by advertisers, credit men, export managers, foreign trade bankers, and the American Manufacturers Export Association.

The Validity of a Treaty

(Continued from page 536).

these facts, but if this is the only way that China can be saved from extinction, then her real friends and well-wishers will reserve judgment, preserve neutrality and hope for the best. If a united China is the final outcome of the Manchurian dispute; if the nation is saved from lapsing into communism, no price is too great to pay for

bringing this about.

China is paying the price for her delay in placing her house in order and in discharging her obligations as a sovereign state. Enough treasure has been frittered away since 1919, to transform China into one of the most powerful and respected nations of the world. With five million men under arms in the country, she cannot stand on her own bottom and repel an invasion from the outside. With ten times as many fighting men as Japan, China appeals to the world to "curb" the territorial ambitions of a powerful country against a weak neighbor. China's note to the League invoking its aid is said to be couched in the gravest terms, but no threats can alter the situation or undo the accomplished fact. The world will not go to war to force Japan to evacuate Manchuria before both sides of the dispute are carefully considered. Japan has a case, and China would be wise to listen to it and make a supreme effort to seek a reasonable solution compatible with her dignity and pride.

PATENT FUEL MANUFACTURE IN JAPAN.—It is reported from Tokyo that the Mitsubishi Co. has decided on the erection of a patent fuel manufacturing plant with an annual capacity of 400,000 tons to utilize the anthracite and bituminous coal from the Takashima colliery. The patent fuel produced will be used for boiler-firing purposes on the locomotives of the Japanese State Railways.

Shanghai Stocks Climbing

a business man wants to know the trend of the market, a business man wants to know whether economic activity is progressive or slack. Often it is easy to get an incorrect impression of the market from the action of a few spectacular stocks; a business man, similarly, may misinterpret economic conditions by allowing a few dramatic factors to color his judgment.

Averages of stocks are a familiar means of affording an investor a reliable gauge of the market; index numbers, in a like manner, are the best means at the disposal of business men for the appraisal of economic conditions. In not a few instances, stock averages form a very good index of economic conditions because market prices reflect the prosperity of corporations engaged in important economic lines. Especially if an average is so constructed as to minimize sensational speculative moves that have no economic basis, there is a definite and most useful relation to economic activity.

It was the object of the American Oriental Finance Corporation in constructing its A.O.F.C. Average of Shanghai Stocks to

present an index of economic conditions as well as measurement of the market. In selecting the twenty stocks, the representative feature was given precedence over the speculative qualities that individual stocks may have.

The movements A. O. F. C. the Average, consequently, have been useful to the business man. On the chart giving a graphical representation of the average, he can trace the course of the market from the first of the year. The sharp rise of February, he knows, is not merely the sensational activity of one or two speculative stocks. A broad list of staid, steady stocks make up the A.O.F.C. Average, and signifi-

cant economic forces must have been responsible for such a spirited advance.

Normally, a business man would start analyzing the situation. The Shanghai Stock Exchange groups stocks under eight official headings:

Banks and Loans; Insurance; Lands; Docks, Wharves, Transport; Utilities; Cottons; Miscellaneous; Plantations.

A group that is immediately eliminated as a factor in a rising market is Plantations. Stocks in this group for some time have been sinking in the market and are now at prices that reduce their significance to a minimum.

Reasons for the market gains early this year are readily discernable from among the other groups. Annual statements of representative companies were being released late in January and early in February. In a number of instances record earnings were reported, and in general there was notable progress.

Basic industries especially had been active. The cotton mills had one of their busiest years. Business was good among the

companies in the Docks, Wharves and Transport group, and the same could be said for industrial organizations listed under Miscellaneous. Stores and Services in the Miscellaneous group, almost without exception, reported banner years.

The continuous growth of Shanghai was favorable to utilities and they forged ahead operating on a larger scale. The same condition was fundamental to the prosperity of the Lands. Banks, Loans and Insurance companies were benefited by the rounded-out progress of Shanghai.

Not only is a business man able to pass good judgment on economic activity through referring to the charted movement of the A.O.F.C. Average, but government bureaus are helped also. In the preparation of a trade report, reference to the movements of the A.O.F.C. Average often give a clearer insight. Political problems are dealt with more surely when there is a concise understanding of economic conditions in the background.

After the advance of Shanghai Stocks in February that carried the A.O.F.C. Average up more than 20% in one month, the market entered a period of fluctuating prices. For the next five months

the A. O. F. C. Average moved up and down, and on the whole made no headway. But on August 6, a new upward sweep of the market started, and stocks gave another impressive display of strength.

The action of the Shanghai market is somewhat in contrast with the movement of stocks in other financial centers. A world-wide business depression of unusual prolongation has adversely affected most mark-With New York taken as typical, the decline from best prices in February of this has been as much as 37%.

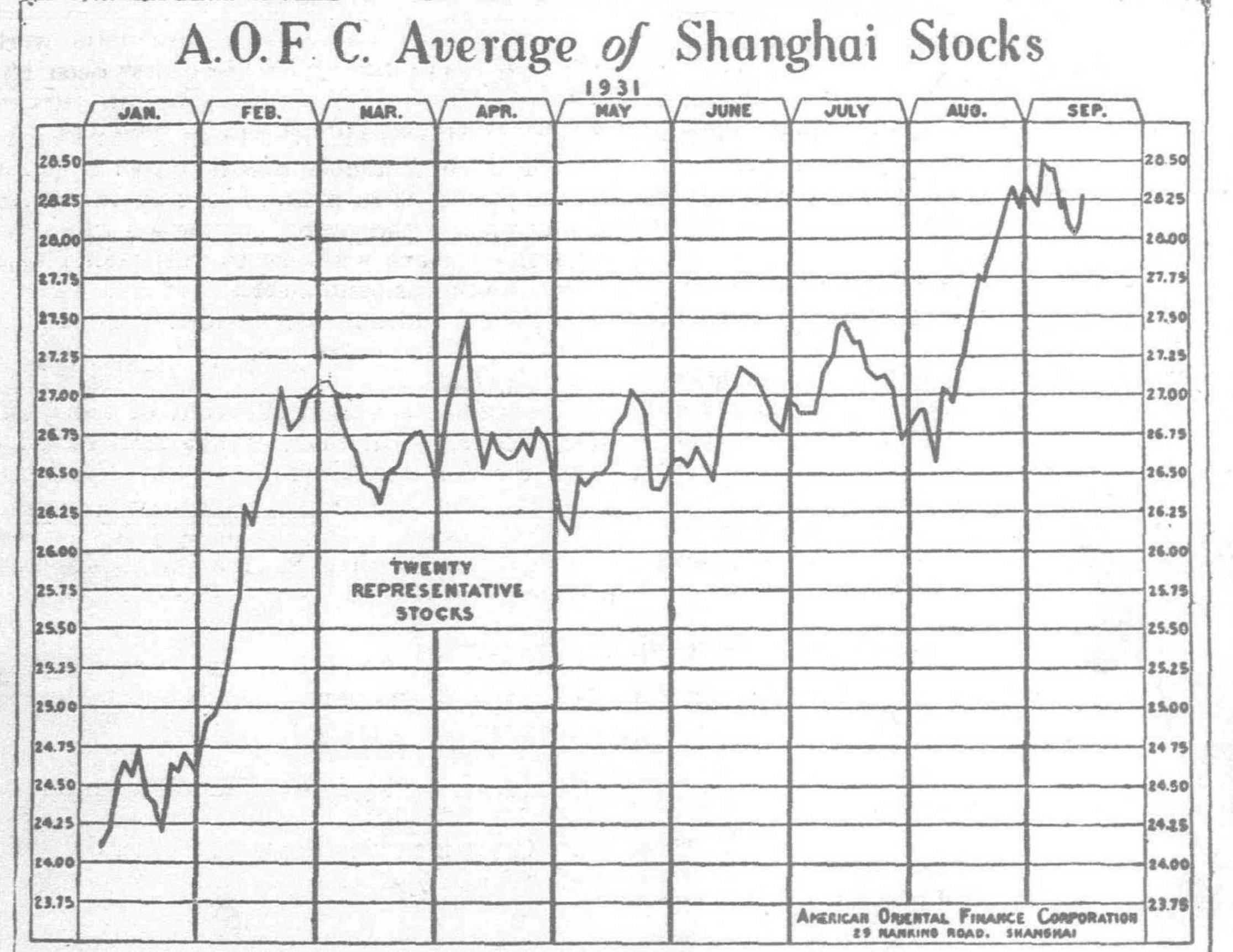
The robust action of the Shanghai Market is clearly to be seen for it resisted the depressing

influences that put the New York market down in the Spring. Gains of Shanghai Stocks were successfully consolidated in the period from February to August and a foundation was laid for the current rise.

The unhalted progress of Shanghai is underlying the strength of stocks. Market followers during the summer months, became more acutely aware that an upward movement of stocks was due. Forces gathered as aggressive leadership was lacking, and finally a concerted movement got under way.

Practically all of the stocks in the A.O.F.C. Average except Plantations participated in the swing upward. American Asiatic Underwriters was a leader at the beginning of the rise, then other stocks such as Asia Realty, General Forge, and Shanghai Lands, came forward well and assumed leadership. One of the most steady gainers has been Trams, and the issue is still in demand as the advance continues.

(Continued on page 546).



Shanghai Telephone Company Expands Service

Two of Seven New Automatic Offices of the System go into Operation

By S. FLEMONS, Engineer-in-Chief, Shanghai Telephone Company

URING the very early hours of August 16, 1931, two of the seven new automatic offices to be installed for the Shanghai Telephone System were cut into service, thus complete the conversion of the system to automatic working within a two year period.

For many months past a vast amount of work has been steadily progressing towards the conversion of these two districts, and on Saturday, August 15, arrangements had been completed and all was in readiness for the opening of the first two of the new exchanges.

At an early hour on Saturday evening the staffs took up their positions at the old and new exchanges at Pichon and Wayside, and also at all the other exchanges in the system, and after completing their preliminary duties and assuring themselves that their own particular share in the cut-over arrangements was completely ready, settled down to wait more or less patiently for zero hour, scheduled for Sunday morning.

At 1.45 a.m. the controlling officer, stationed at Wayside Exchange, and in direct communication with all points, ordered stand by, and at 2 a.m. came the order for which all had been waiting, and which marked the culmination of many months of careful planning and hard work; cut out the old and a moment later cut in the new.

From that moment, as far as the subscribers in the Pichon and Wayside districts were concerned, number please had departed, and dialling tone had arrived

and dialling tone had arrived.

Immediately the work of cutting in had been completed, new tests on lines and apparatus were commenced, these continuing throughout the night and during the following day, no effort being spared to locate and clear up the many minor troubles which must inevitably attend such an operation.

Fig. No. 1 is a schematic diagram of the switches, trunks and switch levels of the Shanghai system as it will be at the completion

of the conversion.

The system is laid out for nine groups each of 10,000 numbers and a double digit group for special service lines:—

The 10,000 group is allotted to Central Exchange ,, 20,000 ,, ,, ,, Lucerne ,, 30,000 ,, ,, ,, West ,, ,, ,, ,, North ,, ,, 40,000 " " " Wayside " ,, 50,000 ", ", reserved for future use ,, 60,000 ", ", allotted to Pichon Exchange ,, 70,000 " Montigny " ,, 80,000 . 22 22 22 "Fokien " ,, 90,000 ,, ,, ,, " Special Services ,, Double 22 22 22 " (00 etc.) Digit

Of the above exchanges:

Central was converted to automatic working during 1927-1928. Wayside and Pichon have now been brought into service. Fokien is scheduled to be brought into service at an early date, and the remaining groups will be completed as soon as possible.

The present number scheme gives a capacity for 90,000 lines but the system is so planned that it can be increased to 900,000 at such time as the growth of the system necessitates the change, and this of course will require the change from five to six digits in the subscribers' numbers.

The New Exchanges

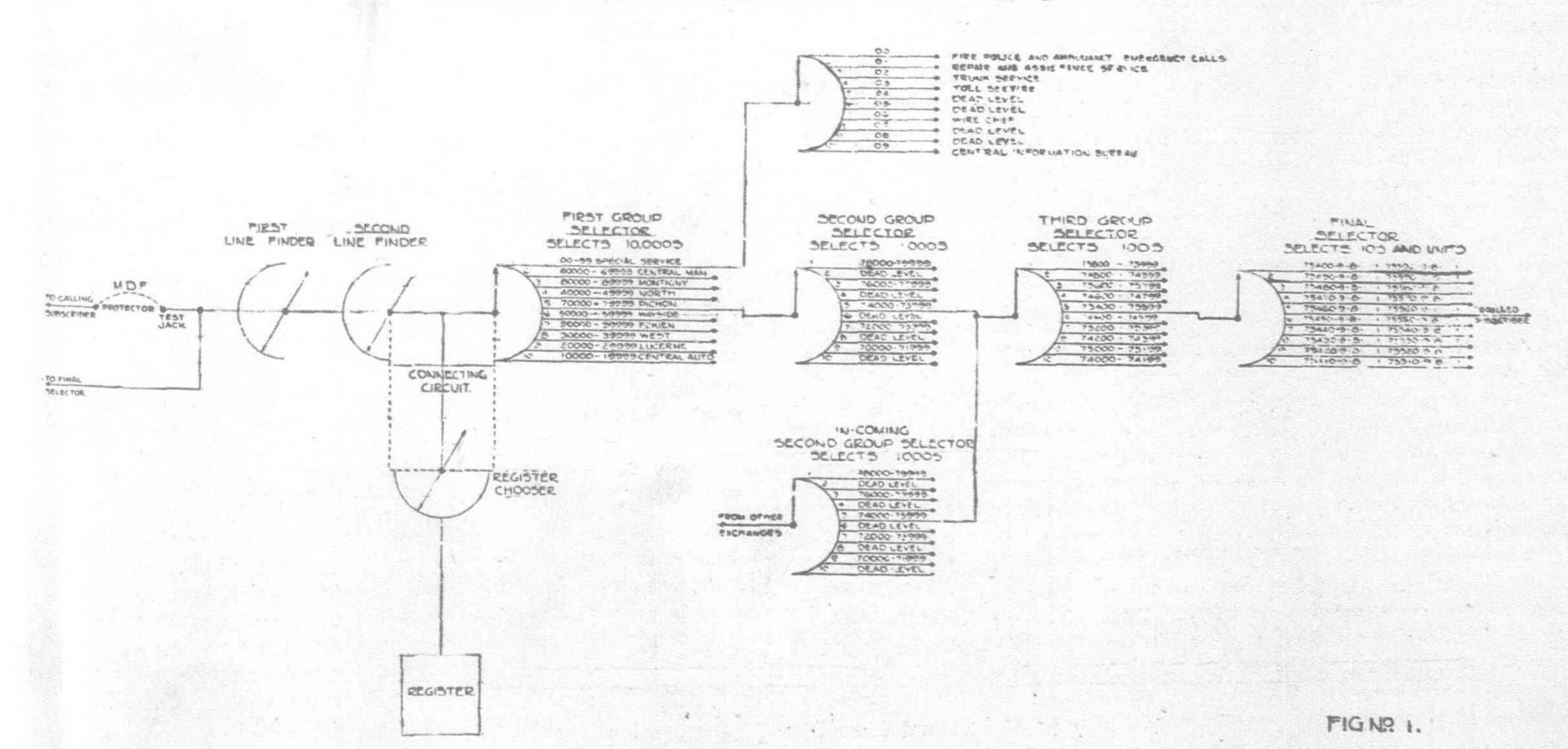
The new exchanges are situated some considerable distance apart, one being in Route Pichon and the other at the corner of Ward and Paoting Roads.

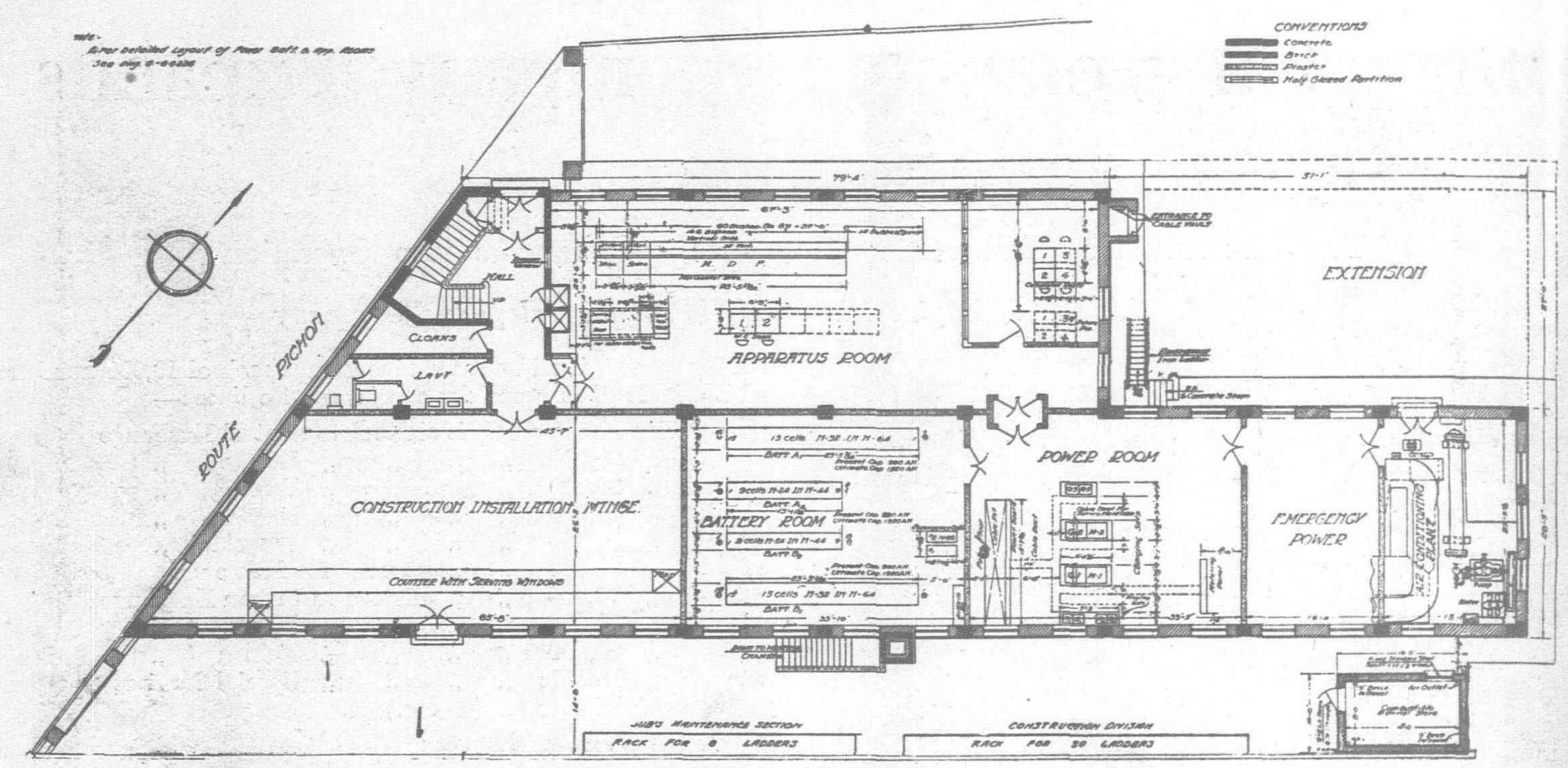
Both buildings are of modern construction, specially designed to house the automatic equipment and its associated apparatus.

Figs. Nos. 2 and 2A give the layout of Pichon Exchange, the layout of Wayside is practically identical.

DHANGHAI TELEPHONE SYSTEM

SCHEMATIC DIAGRAM SHOWING CALL ROUTES





Floor Plan Pichon Station

Both buildings have an ultimate capacity for 10,000 subscribers' lines in addition to the necessary trunks; the initial installation for Pichon is 4,000 subscribers' lines and Wayside 3,000. The number of lines cut into service on the 16th were Pichon 1,578 and Wayside 1,930. Another 1,700 lines are scheduled to be cut into Pichon later on.

Cable Vault

The cable vault is situated immediately below the Test Room. Lead sheathed cables each containing 1,800 or 1,200 wires, enter the building by means of the vault. Part of these cables go to the outside distribution terminals and subscribers' telephones, and others run underground to the various exchange buildings thereby providing the links via which calls can be routed over the system.

Each cable is laid systematically in a predetermined position on the racks and is labelled. Any individual cable can therefore be located without delay and without interference with other cables.

In the vault the cables are sub-divided into smaller cables containing 600 wires. Thus a 1,800 wire cable would split into three 600 wire cables and so on.

The 600 wire cable leads from the vault into the Test Room above.

Apparatus and Test Room

The cables from the vault enter into this room and terminate on vertical strips on the main distribution frame. Cables from the automatic switchroom terminate on horizontal strips on the

opposite side of the frame. The object of this frame is to effect a distribution between the underground cables in which the wires are in geographical order and the switch-board cables in which the wires are in numerical order. The vertical strips carry protectors and heat coils to safeguard the exchange apparatus from possible damage due to extraneous causes such as lightning discharges, or contact with power and lighting circuits. In passing it should be noted that the apparatus at the subscribers' premises is likewise protected. This frame also carries break jacks to facilitate the rapid testing of lines and exchange apparatus.

Near the frame is the Wire Chief's Desk, this is provided with up-to-date equipment for testing. From this desk, tests can be made to determine the nature and location of any trouble which may arise on the subscribers' lines either in the exchange or on the outside lines or apparatus.

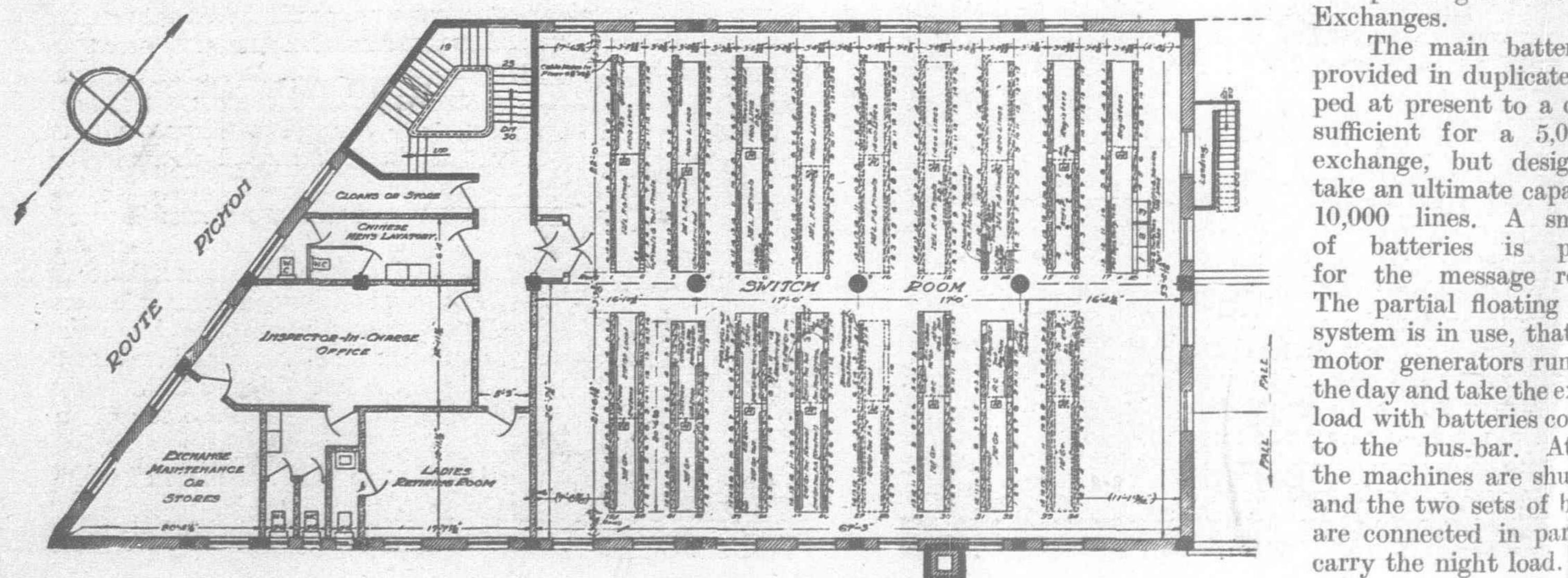
Power and Battery Rooms

In the power room are the machines to provide power for the exchange. The public supply mains enter the building here and terminate on a switch panel containing the meters, fuses and switches associated with the supply mains. On the opposite side of the room is installed the power switch-board for the automatic exchange. Motor generator sets are provided in duplicate to convert the 196 volts three phase AC (Pichon) and 350 volt three phase AC (Wayside) of the public supply to 50 volt DC for use in the exchanges.

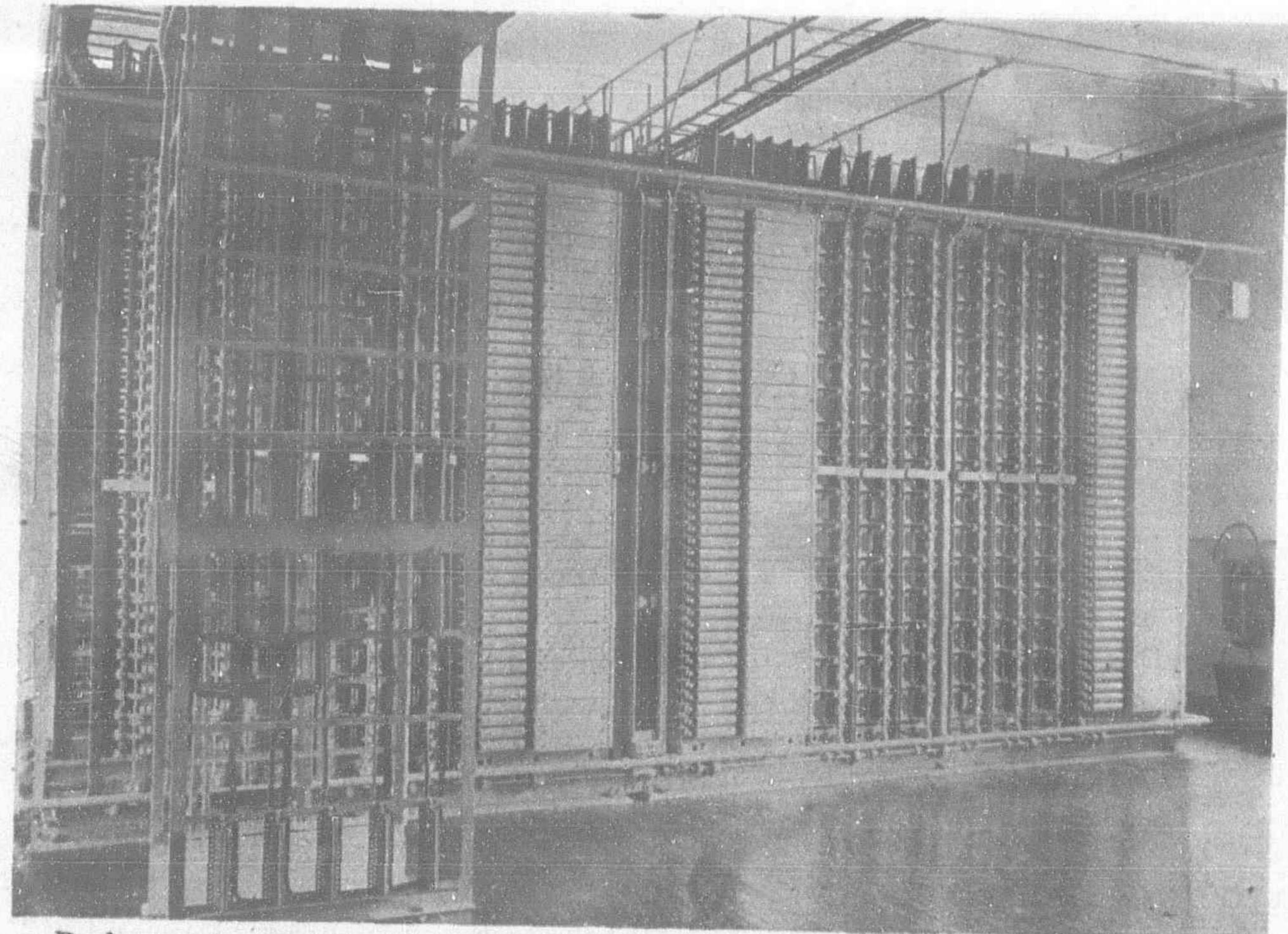
An additional motor generator is provided to supply power

for operating Private Branch Exchanges.

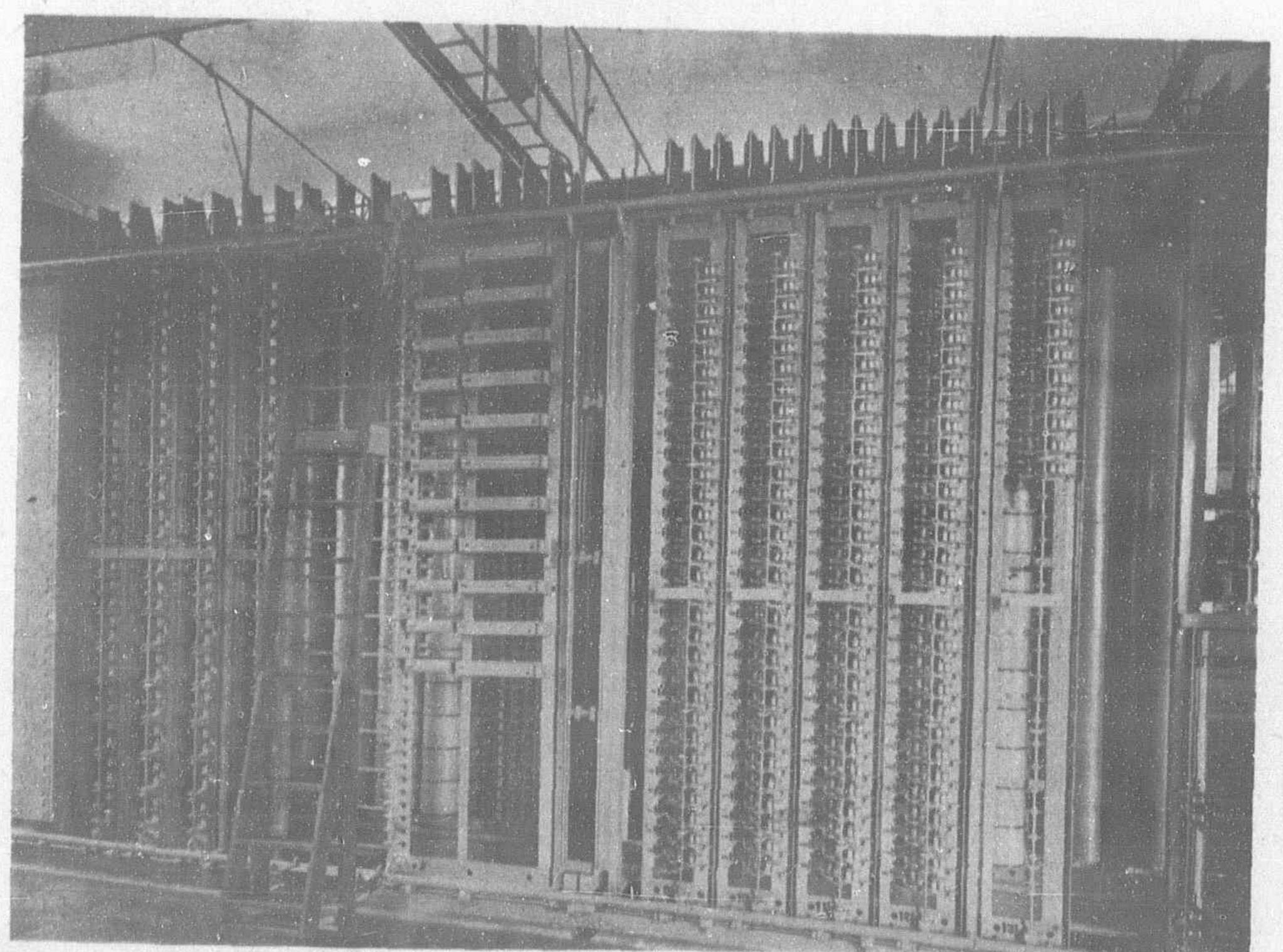
The main batteries are provided in duplicate, equipped at present to a capacity sufficient for a 5,000 line exchange, but designed to take an ultimate capacity for 10,000 lines. A small set batteries is provided the message registers. The partial floating battery system is in use, that is, the motor generators run during the day and take the exchange load with batteries connected to the bus-bar. At night the machines are shut down and the two sets of batteries are connected in parallel to



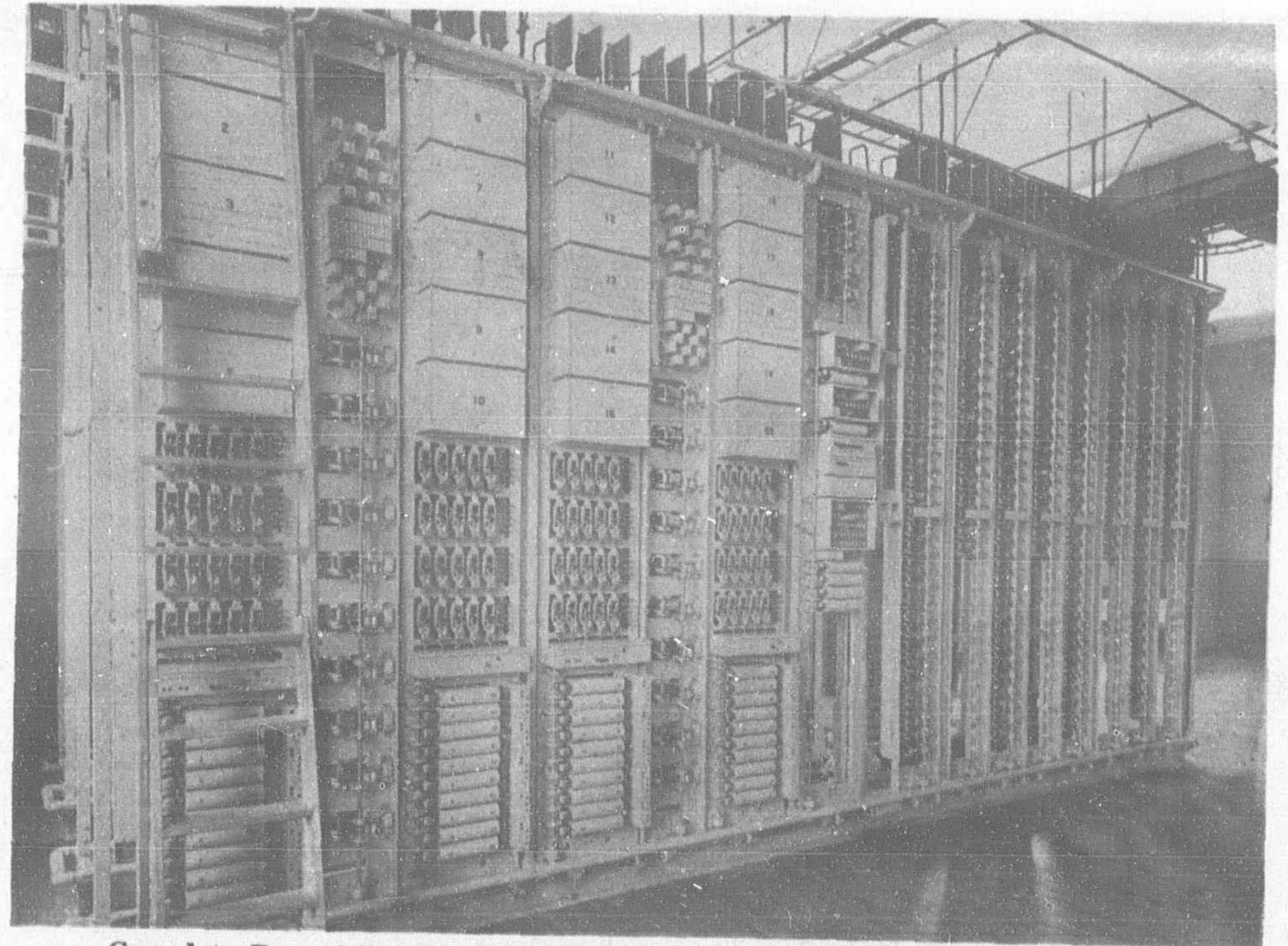
Second Floor Plan Pichon Station



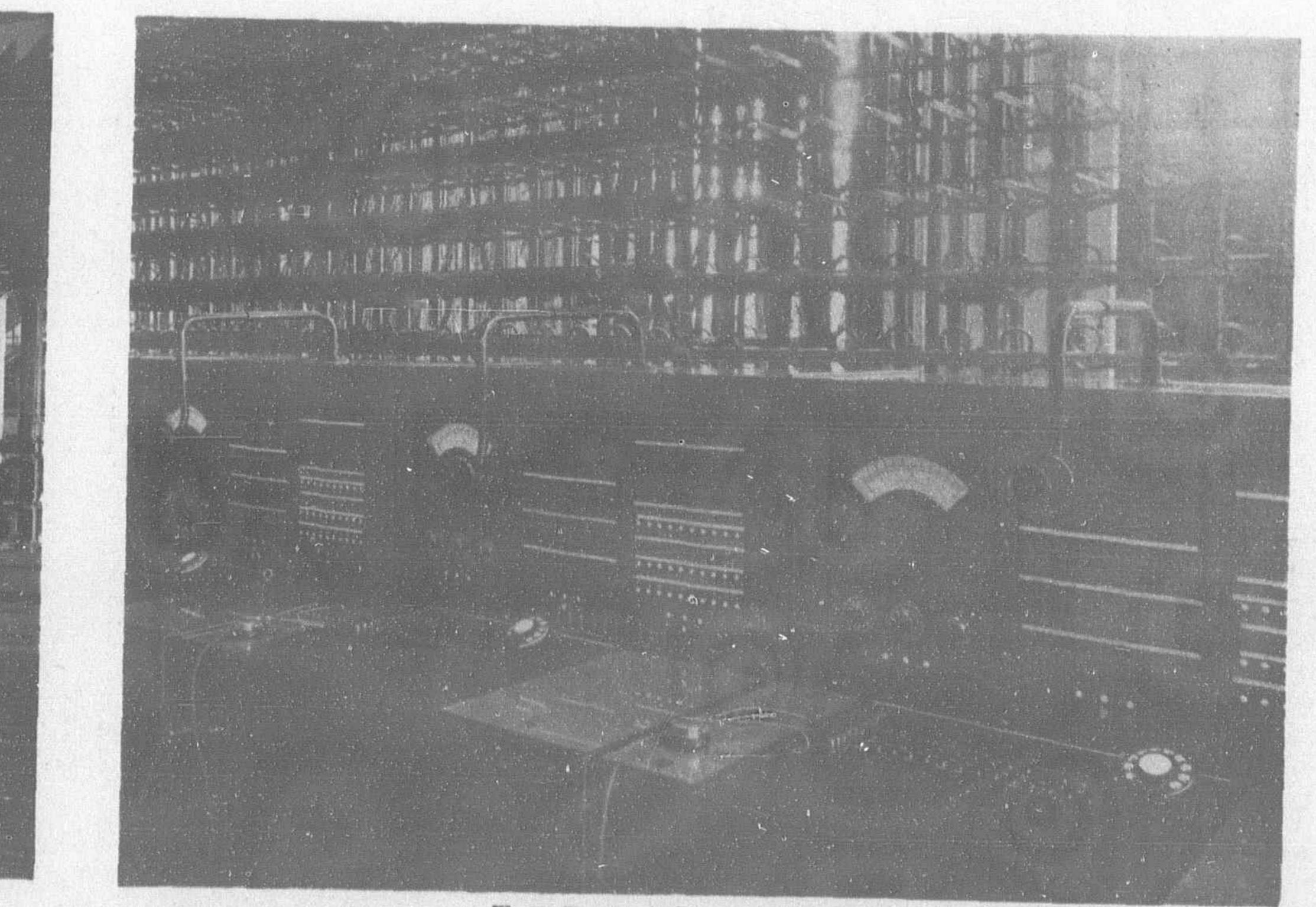
Background, First Group Selectors: Foreground, Cross Connecting Bay for Same (Wayside Exchange)



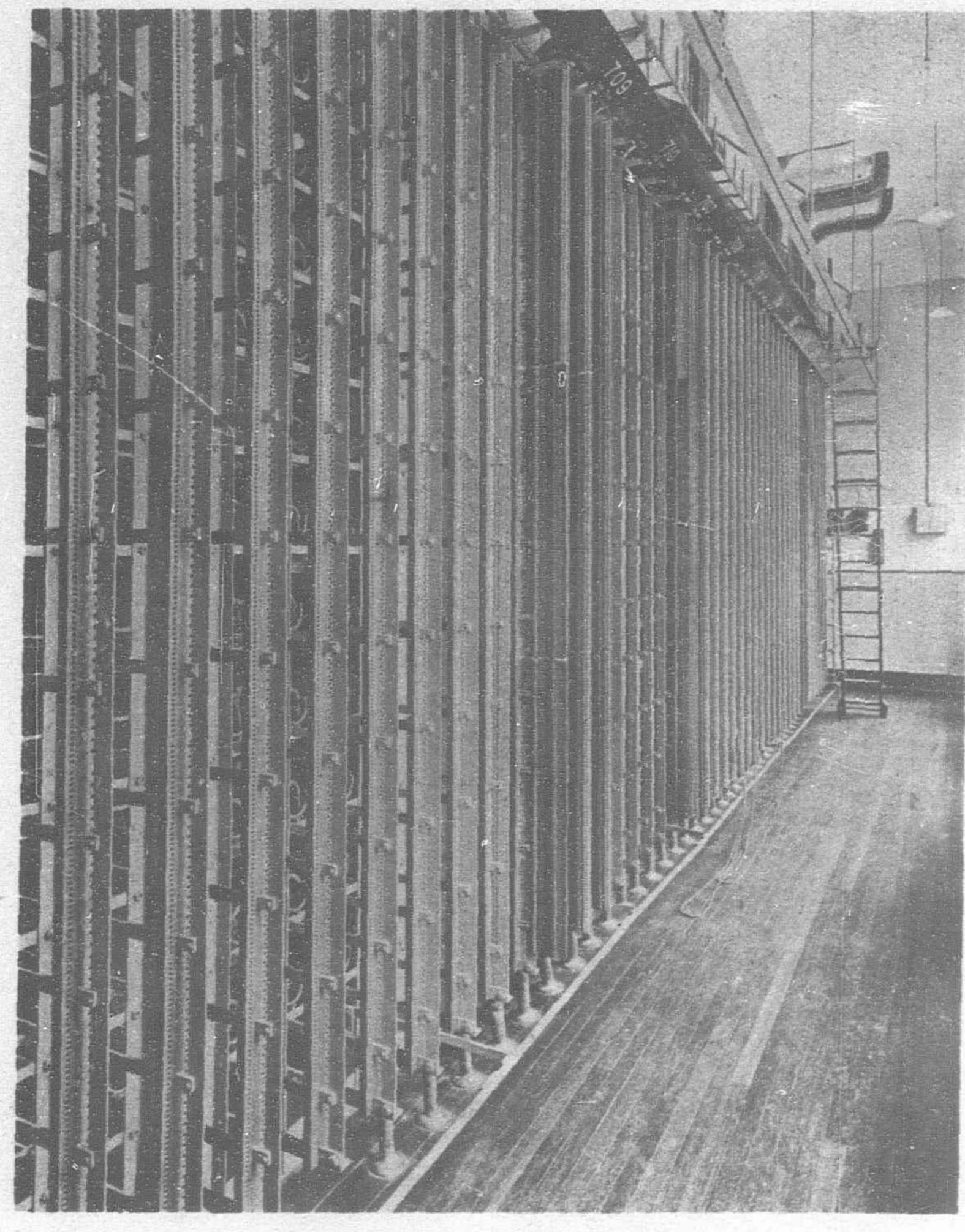
Register Choosers and First Group Selectors (Wayside Exchange)



Complete Bay of Registers and Second Line Finders (Wayside Exchange)



Test Desk (Pichon Exchange)



Main Frame (Pichon Station)

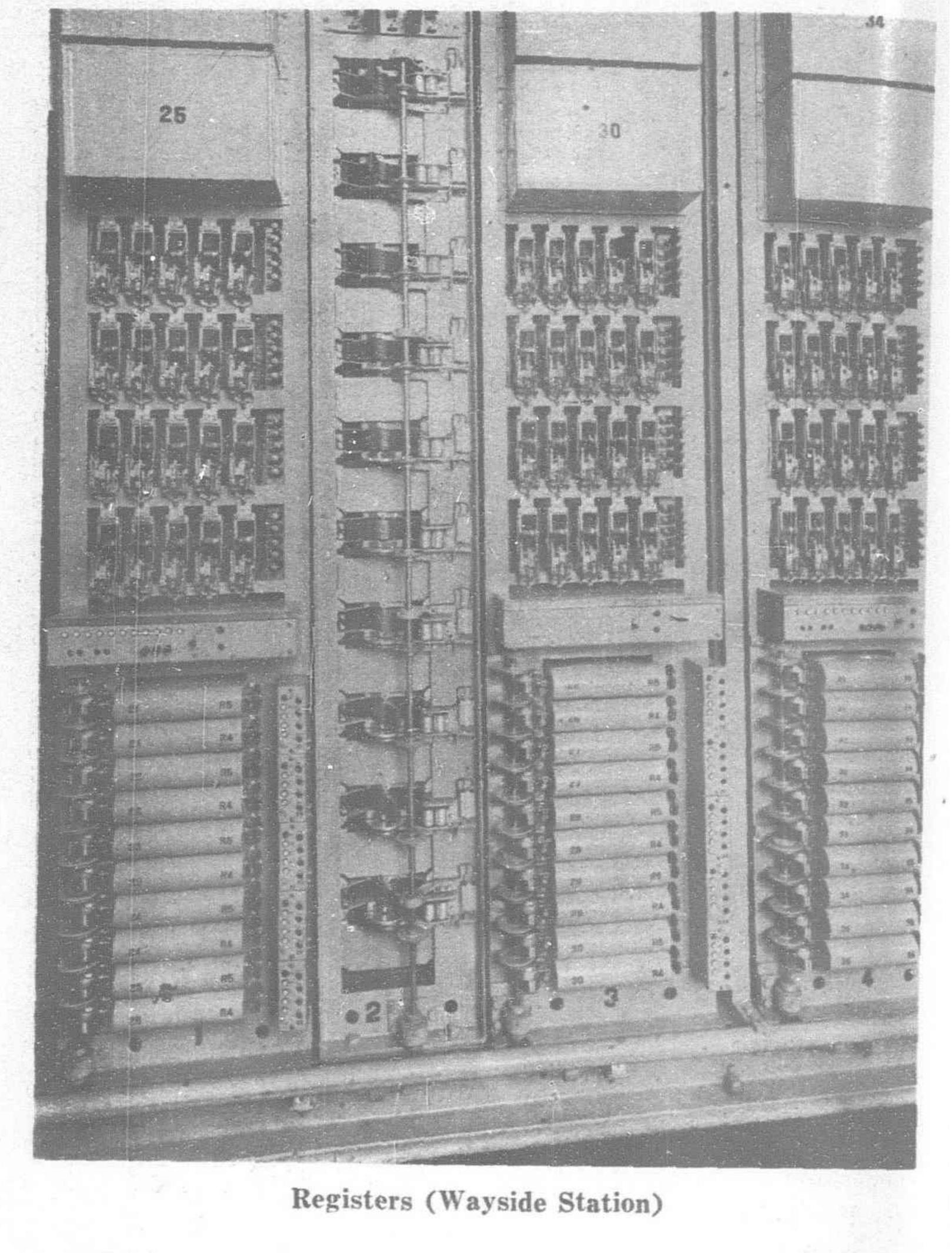
Air Conditioning Plant Room

The climate of Shanghai is severe with temperatures ranging from 20° F. during the winter to 100° F. during the summer. The relative humidity is particularly high, often in the neighborhood of 90 per cent for days at a time and 100 per cent is registered

on numerous occasions. Shanghai is developing rapidly into a manufacturing center and the foreign deposits conveyed in the air are considerable. Dust and dampness tend to have a deleterious effect on the equipment and these conditions call for special treatment. The Company in its policy to provide an efficient service have taken all reasonable precautions in the protection of its equipment, therefore air conditioning plants have been provided in all of its exchanges. During the summer months the air circulated throughout the equipment rooms is passed through a drying plant where it loses its humidity; at the same time the air is washed and cooled, so that by these means we are assured as far as possible that ideal conditions are maintained in the rooms. Automatic control of the air circulation is provided; a recording hygrometer gives a continuous record of the humidity, which is maintained below 70 per cent.

Automatic Switchroom

The automatic switchrooms are equipped with the well known Rotary machine switching system. The new



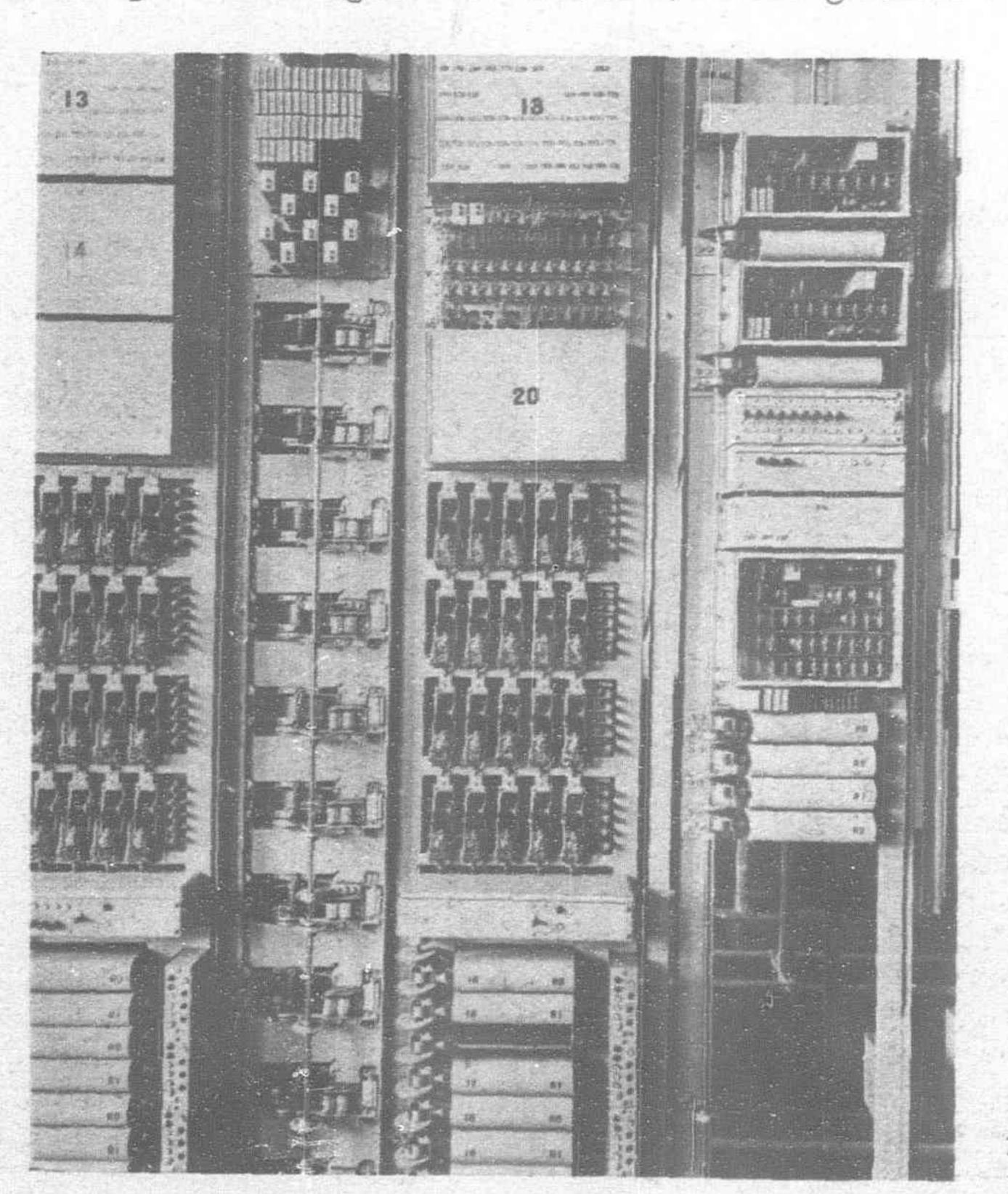
exchanges use an operating potential of 48 volts. To the left of the entrance doors are installed the Line Finder and Final Switches. These are fitted on adjacent bays on the same racks. At the extreme left of the room are the registers, and second line finder switches. On the right hand are fitted the second and third selector switches, incoming selectors and register choosers.

The monitoring desk is located near the registers; on this information is given as to switches held up for periods longer than that required for their normal operation. Also from this desk, traffic observations are taken.

Function of Switches

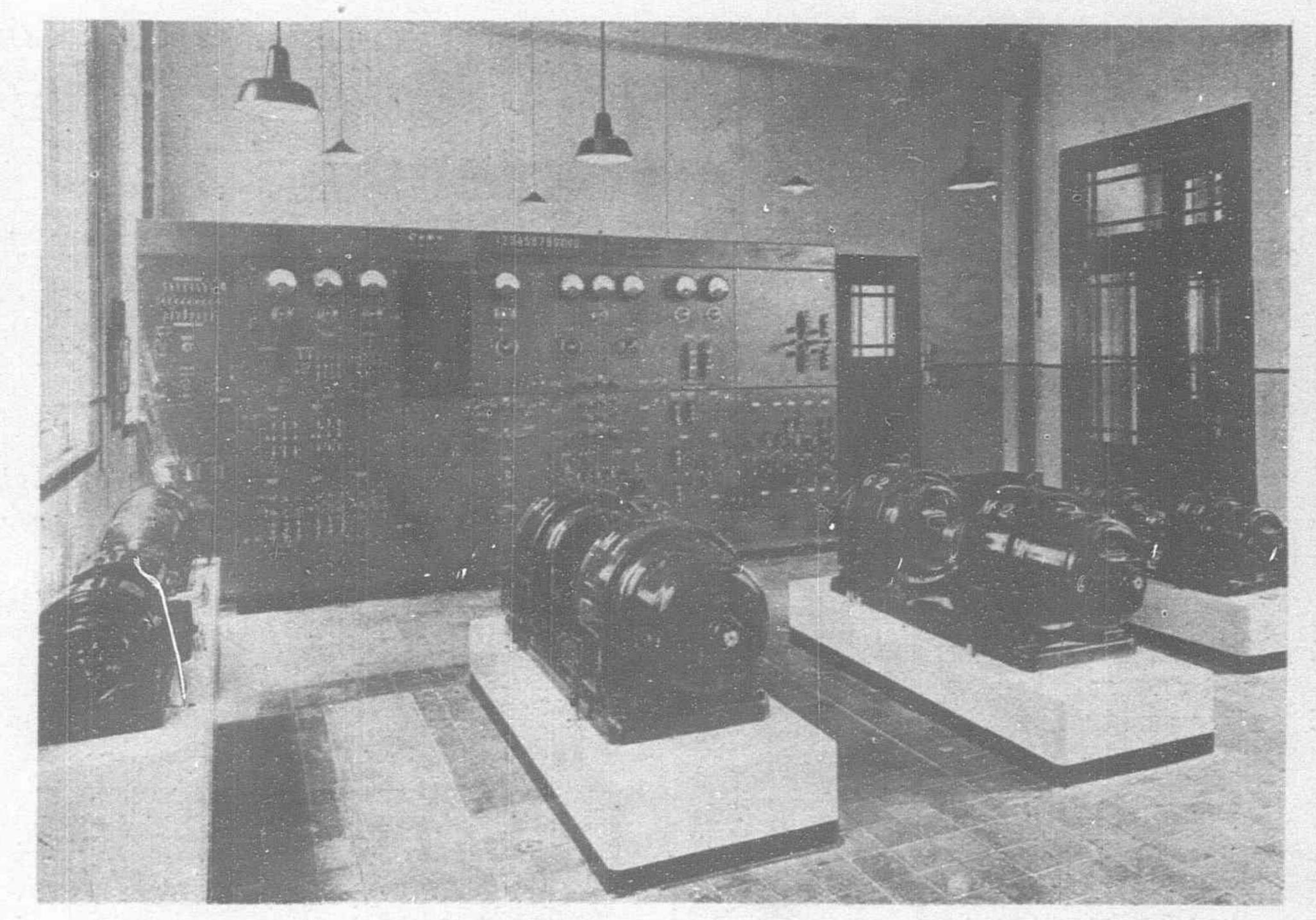
The function of first line finder is to locate the calling line and with the assistance of the second line finder to route the call forward and connect the line to a register and selector switch. The second line finder is to assist in routing the call to the register, and also to connect the line to the first selector switch. The register chooser connects the line to a free register. The register receives the number impulses sent in by the subscriber when operating the dial on the telephone. The register selects the train of switches that are necessary to route the call to the wanted number, sees that the connection 18 completed and it is then released from that line, to render the same assistance to other calling subscribers.

The first selector connects the calling line to the 10,000 group of



Registers (Relay and Sequence Switch Covers Removed) (Pichon Station)

numbers in which the number wanted The second located. connects the selector line with the 2,000 group of the number. selector third connects the call to a group of 200 lines in which is located the wanted number. The final selector first chooses the group of ten in which the number is located and then completes the connection to the wanted line. The register is released from the line immediately connection is made to the wanted number; all other switches are held mechanically during conversation and are not released until subscriber replaces the hand set on their telephones.



Power Room (Pichon Station)

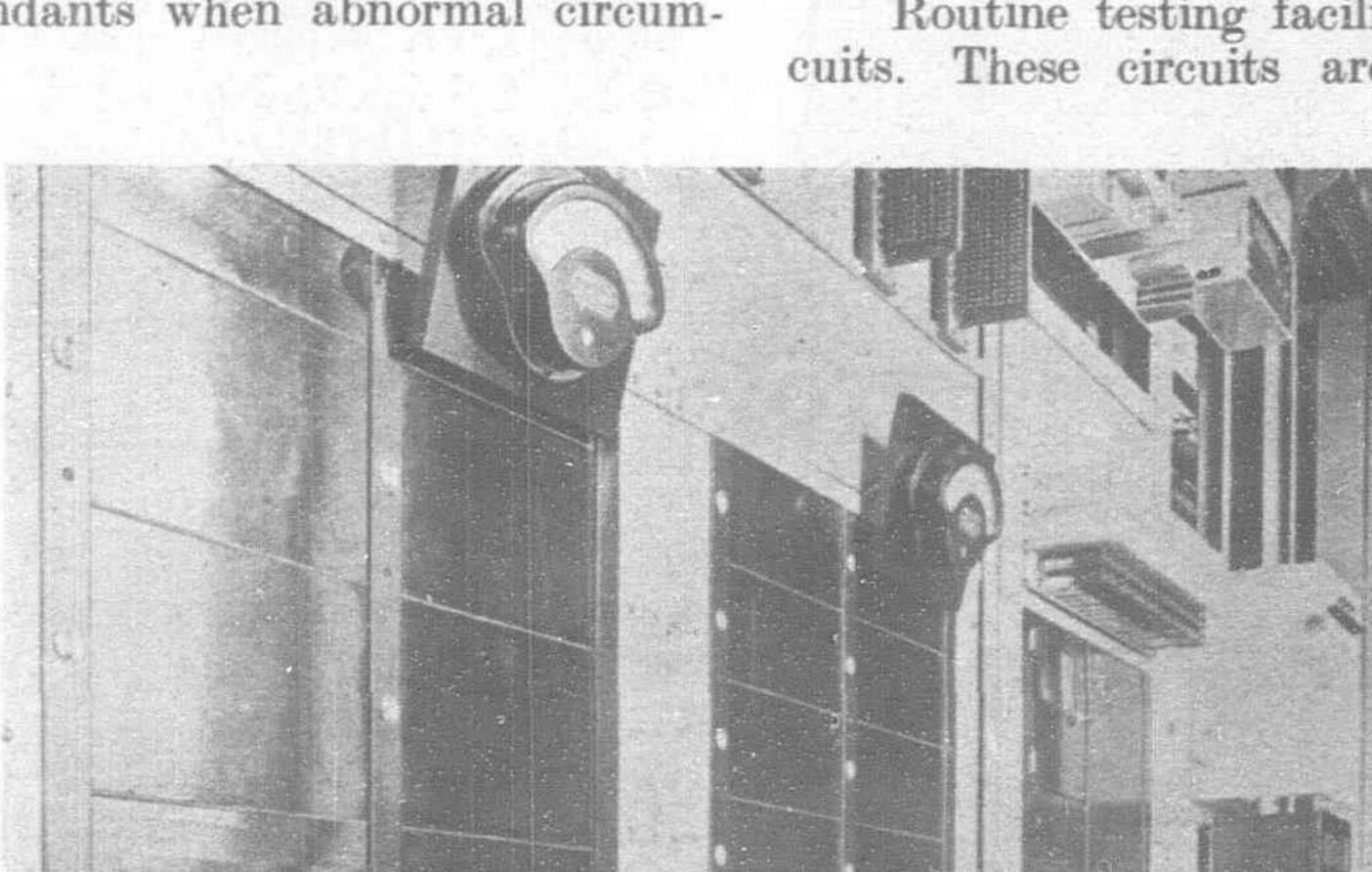
Service Precautions and Alarm Signals

Special precautions are taken to safeguard the service against breakdowns and congestion, and alarm signals are provided to attract the attention of the attendants when abnormal circumstances arise.

Of the many alarms provided the following are the most important:—

- (1) The failure of main current supply.
- (2) Ringing current failure.
- (3) Stoppage of switch bay motor.
- (4) Blown fuses.
- (5) Blown heat coils.
- (6) Registers failing to release.
- (7) Faulty subscribers' lines giving a permanent call to the exchange.
- (8) Connecting circuits failing to release.
- (9) Final selector failing to release.

The register having a very important bearing on the progress of traffic through the exchange, special care is taken to see that these switches are not unduly held by faulty lines or by other causes. When a line is connected to a register, if after a period of 30 seconds no dialling impulses are received, the register connects the call to the monitoring desk and automatically releases itself from the line. Should a subscriber fail to dial the full number of digits (due frequently to commencing to dial before receiving dialling tone), or for some other reason the register be held after dialling has taken place, the register will also within a certain period release the calling line, but it can if desired by the attendant hold any switches



Out Trunk and Traffic Recording Desks (Pichon Station)

that have failed to function correctly whereby the man can locate the switch and rectify the trouble.

The switchrack motors have duplex windings, normally operating on 196 volt three phase AC(Pichon), 350 volt three phase AC (Wayside) in case of failure they automatically change over to operate on 48 volt DC supplied from the batteries installed in the building.

The ringing motor generators are by means of a changeover switch automatically connected to the 48 volt DC supply should a failure occur on the outside mains. Emergency lights operated on 48 volts in the automatic

equipment, test and power rooms, are automatically switched into service when normal light currents fail.

Routine Testers

Routine testing facilities are provided for all important circuits. These circuits are so arranged that the circuit on test

is subjected to conditions which are more severe than those likely to be met with in actual practice. The latest development in routine testers installed in the new exchanges enables tests to be made automatically or individually. This is a great advantage as it allows the patrol man to place the automatic routine tester in operation, while he is free to carry on other duties. Should a fault be located by the Routine tester, the tester will stop, hold the faulty switch and give an alarm to attract attention. The routine testers can be set to take complete tests which comprise many cycles which may be repeated or not. In addition to the complete test a single cycle may be tested only, such tests may also be repeated indefinitely. A repeat test is used for cases where intermittent trouble is suspected.

Traffic Observations

Service observation equipment permits the following observations to be made:-

- (1) Metering of overflows in line finder switches.
- Metering of total number of calls passing through a group of registers or selector switches in a given period.
- Metering of all trunks busy in a group of register or selector switches.

- (4) Observations of simultaneous calls in a group.
- (5) Average holding time of switches.

Automatic observations on any group of switches can also be made by means of a recording ammeter.

Progress of Construction Work

The rehabilitation of the system and the introduction of new exchange areas has meant almost entirely a new layout and redistribution of the underground cables and outside plant, beside the erection of the new buildings and the installation of the automatic exchanges.

Much progress has been made as will be seen from the following figures, six of the seven new buildings have been completed. Two of the new exchanges have been brought into service, and one more now undergoing its final tests will be placed in service in a short time, while the following figures give some indication of the progress on underground and aerial plant construction and the changing of subscribers' apparatus.

TOTAL CABLE PLACED

			Feet of cable	Miles of wire
Aerial			760,891	17,001
Underground		••	384,333	95,532
Total			1,145,224	112,533

TOTAL CABLE SPLICING

- 7,292 cable splices made, involving the splicing of 3,581,-606 wires.
- 1,823 of the above splices were made on working cables, involving the splicing of 1,093,800 additional wires.

OTHER WIRE PLANT

- 18,997 loops run from aerial or block cable to subscribers' premises, involving the use of 1,753,033 feet of wire.
- 60,205 feet of old aerial cable recovered.
- 44,866 feet of underground cable recovered.
 - 52 miles underground duct laid.
 - 255 new manholes built.

SUBSCRIBERS' APPARATUS CHANGED

- 2,392 manual telephones have been replaced by automatic telephones. The total number of replacements required for the whole conversion is 15,370.
- 2,754 dials have been fitted to instruments which were otherwise suitable. The total number of dials required for this purpose is 8,180.
- 300 private branch exchange switch-boards were required for manual replacements. These have all been changed and are already working.

 With these two new exchanges in operation there are now 15,014 telephone stations on the automatic system, equal to 44.5 per cent of the entire number of exchange telephones.

Cutting Out the Old Exchanges

In conclusion, it must be remembered that although the new exchanges at Wayside and Pichon are now in operation, several things remain to be done before that part of the work can be said to be finally completed. New exchanges as new machines, must pass through a running-in period, and during this period it is reasonable to expect that the necessity will arise for a certain amount of re-adjustment. Added to this, is the necessity for removing such old cables and wiring as were required to keep the subscribers working on the old exchanges while the new exchanges were being constructed.

Shanghai Stocks Climbing

(Continued from page 540).

The stocks that make up the A.O.F.C. Average are selected as representative of economic activity in Shanghai and this feature is to be maintained. It is contemplated, therefore, to substitute stocks from time to time as it becomes advisable to introduce adjustments that will make the Average effectively representative.

The stocks that now make up the A.O.F.C. Average are named below under group headings that are official with the Shanghai Stock Exchange.

Two Banks and Loans:

American Oriental Finance "B" International Investment Trust

One Insurance:

American Asiatic Underwriters (Ord.,

Three Lands:

Asia Realty "B"
Cathay Land
Shanghai Land Investment.

Two Docks, Wharves, Transport:
New Engineering & Shipbuilding
Shanghai Dock & Engineering

Two Utilities:

China General Omnibus Company Trams (Bearer)

Two Cottons:

Ewo Cotton Mills (Ord.) Shanghai Cotton Mfg. Co.

Six Miscellaneous:
Auto Palace Co.
Caldbeck, Macgregor & Co.,
Chinese Eng. & Mining Co. (Kaipings)
General Forge Products, Ltd.,
Kelly & Walsh, Ltd.,

Two Plantations:

Anglo-Java Plantations Tanah Merah Estates

Office Appliance, Ltd.,

The only uniform list of prices on Shanghai stocks is that published every morning by the Exchange. Every stock is priced each day on this list which is published after the first auction of the day. Prices often change although no business is actually done.

The level of the market is therefore quite as important in Shanghai as changes in price brought about through an actual sale. The A.O.F.C. Average is compiled from this uniform list of daily prices published by the Shanghai Stock Exchange. Thus the Average, shortly after ten o'clock each morning, makes available to the public the level of the Shanghai Market.

Gold Mining in Manchuria

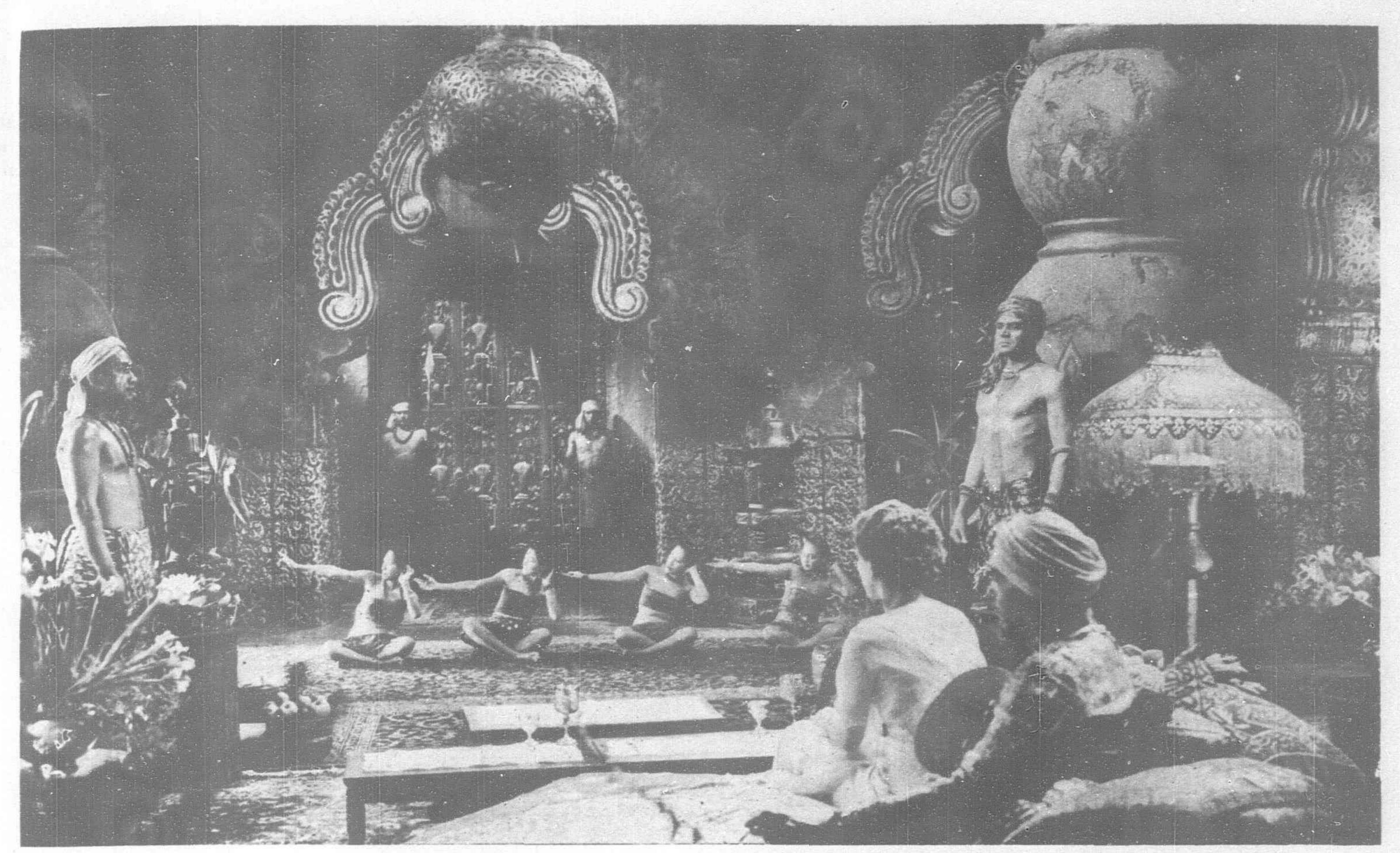
Gold mining on an important scale, backed by foreign capital, is likely to be commenced in North Manchuria very shortly.

There are extensive gold deposits and these have been worked by primitive methods for some years past. The gold near the surface, however, is now becoming exhausted and machinery and dredging plant, necessitating a considerable outlay of capital, are required if the ore at a greater depth is to be recovered.

Up to the present all attempts made by foreign firms to start mining enterprises have failed, owing to the restrictions placed by the Chinese mining law upon the introduction of foreign capital. It is understood that these difficulties have now been overcome by the Northern Gold Dredging Company, a British concern, with its head offices in London.

This Company, working in close co-operation with Chinese, has obtained a concession to work, firstly, the gold deposits in the territory controlled by the Hsingan Colonization Bureau and, later, those in Kirin Province. The contracts in both cases have been approved by the Central government.

Extensive prospective work will begin this year.



An interior scene from Universal's production "East of Borneo"

Recording Sound for Motion Pictures in Asiatic Jungles

Account of difficulties experienced in making motion pictures in far away locations, with emphasis on the problems of the sound technicians as encountered on Universal's expedition to Southern Asia By GORDON S. MITCHELL, Engineer, Sound Department, Universal Pictures Corp'n Pacific Coast Studios.

to send a motion picture company to Borneo and the Malay States to film an adventure picture, they realized that they were inviting problems which would take more real pioneering and ingenuity on the part of the sound personnel accompanying the troupe than had ever before been necessary since the advent of recorded sound to motion pictures. The problems of recording in the jungles differ considerably from the problems encountered in the studios at home—the success of such an expedition depends in great measure upon the ability of the technical staff to cope with all manner of difficulties with a minimum of equipment and supplies.

The sound crew chosen to accompany the expedition consisted of two men who, by reason of their former occupation and experience, were particularly well fitted for the trip. Mr. Clarence Cobb, a former naval radio technician, was appointed amplifier man, and Mr. Fred Feichter, a former motion picture electrical man, was appointed mixer. These two together brought back approximately ninety thousand feet of sound recorded under the severest of conditions.

In past years, motion picture studios have sent expeditions into far-away places for the purpose of filming scenery in the natural, but heretofore without the benefit of sound recording. The expedition into Southern Asia was fraught with new difficulties—difficulties which had to be

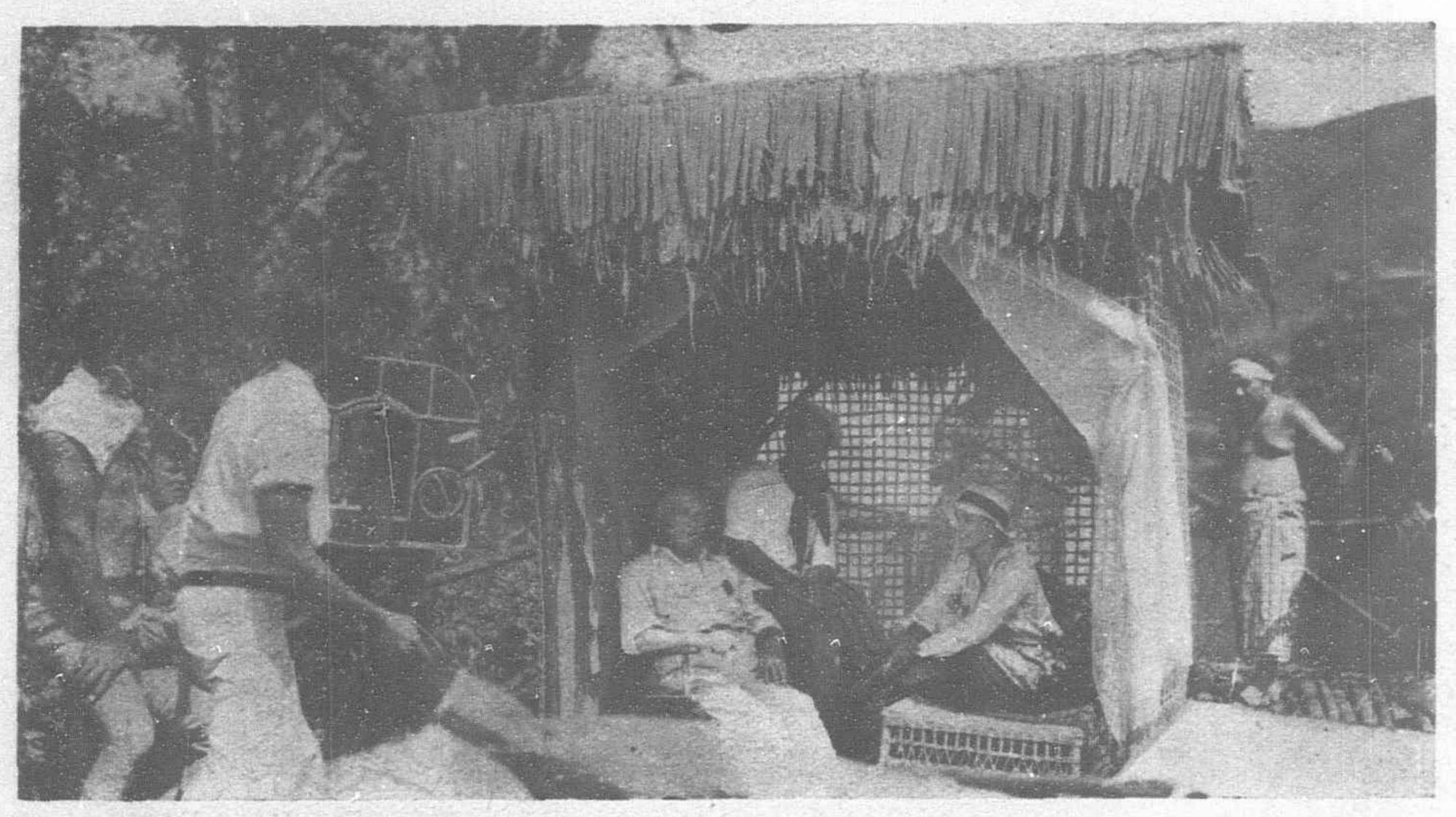


Rose Hobart in the Universal drama "East of Borneo"

solved without the aid of past experience or procedure. While the cameraman had the knowledge gained on past trips to fall back upon, the sound technicians were pioneering into absolutely new experiences.

The tremendous amount of preparation necessary before actual departure of a motion picture company for a distant location can hardly be imagined. Every contingency had to be foreseen and preparations made to care for any possible event which might arise and cause a delay in production. Spare camera parts—spare parts for the recorders—all items which would not be easily replaceable in distant countries had to be furnished in duplicate in order that there might be no delay while waiting the shipment of any item of equipment which might need replacement before the end of the trip. The old adage "Time is money" is never more true than when applied to a motion picture company on location.

The multitudinous preparations for departure completed, the company, consisting of the two sound technicians, two cameramen, two laboratory technicians, a director, a business manager, a production manager, a secretary, and two actresses left the studio and travelled directly to Vancouver, B. C. In addition to the personnel, twenty-three thousand pounds of baggage was necessary for the purposes of the trip. At Vancouver they embarked on the Pacific s.s. Empress of Russia, sailing for Hong Kong, where a short layover was made for



George Melford (director), George Robinson (cameraman) and Rose Hobart relax between shots on "East of Borneo"

the purpose of filming Chinese street scenes for the picture "East is West" which was then in production at the studio. The P. and O. steamer Kiver was taken for Singapore upon the completion of the work in Hong Kong.

It is appropriate to explain at this point that on expeditions of the kind it is necessary to develop the film each day as exposed, in order to avoid the deterioration which sets in if the film is stored undeveloped. This is true in a measure of the film used in photography,

but is particularly true of sound track film. Due to inherent characteristics of the sensitized film, sound track if not developed within approximately twentyfour hours after exposure will deteriorate resulting in a loss of the high frequency components of the recorded sound. Sound track so affected due to the neglect of the necessity for development soon after exposure will sound muffled and boomy when developed and projected in the theaters (reproduction of sound, as well as reproduction of the picture is known as "projection" in studio vernacular.) Consequently it was necessary that a complete laboratory unit, capable of developing and printing the motion picture film and sound track be carried along and set up always within twenty-four hours travelling time of the production unit of the company. Necessity for power, pure water, and certain definite constructional characteristics of the building wherein the laboratory is housed (must have lightproof rooms, etc) limit the available locations for a laboratory unit. The unit is usually set up in the largest town or city which is within the required travelling time of the shooting location. The negative is developed daily, but is held at the laboratory and shipped back to the studio in California about once each month.

After arrival in Singapore, first preparations were made for the actual filming of the picture. The laboratory unit was assembled in a rented building while the production unit made plans to travel four hundred miles up the east coast of the Malay States

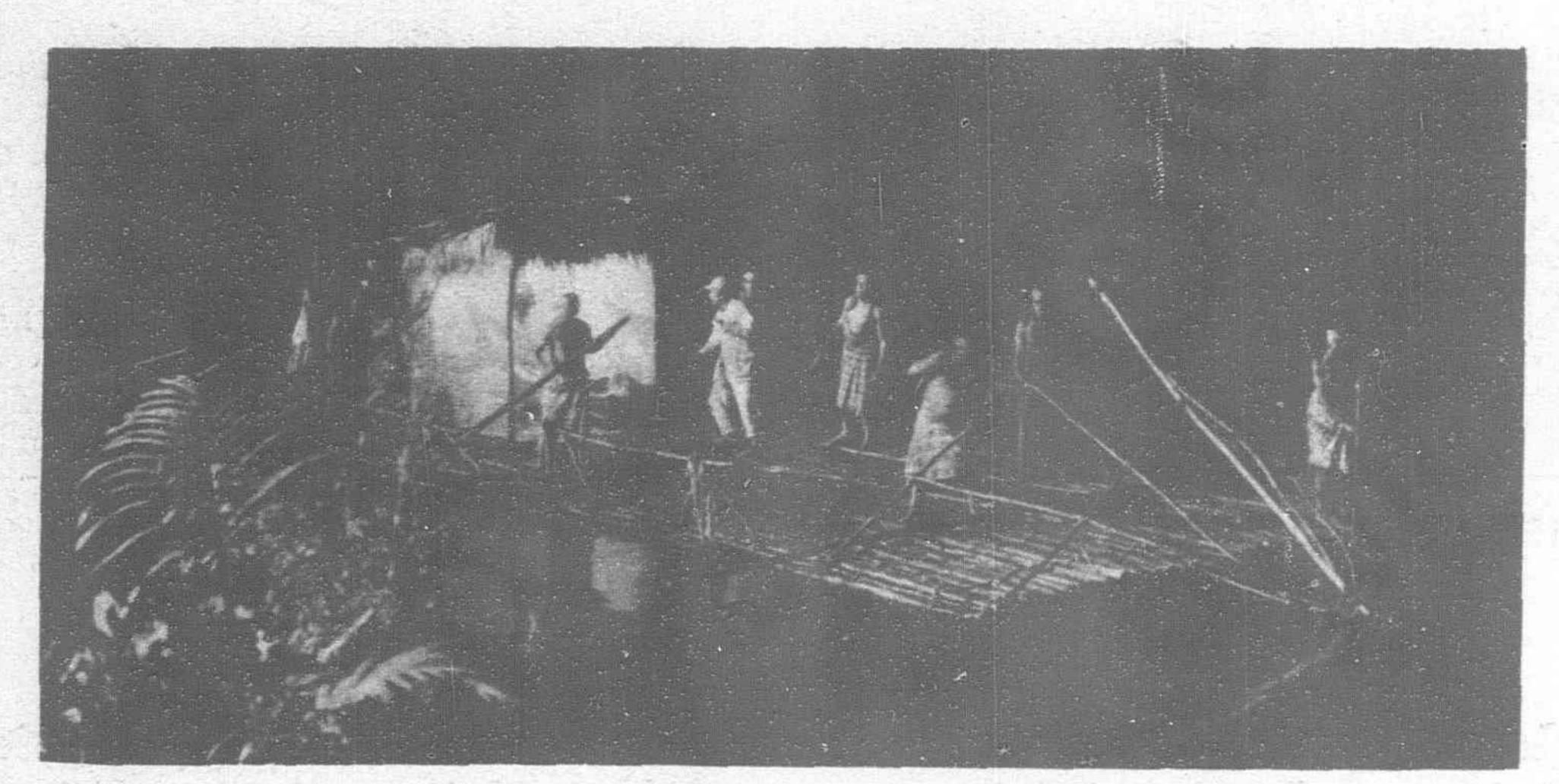
to a small fishing village, Quantan by name. It might be of interest to note that two General Electric cooling units were used by the laboratory technicians, one for keeping the developing solution, the other for keeping the domestic water supply, cool. Developing tanks, printing racks and all of the other paraphernalia of a photographic laboratory were set up in the building procured in Singapore.

Two weeks were passed by the production

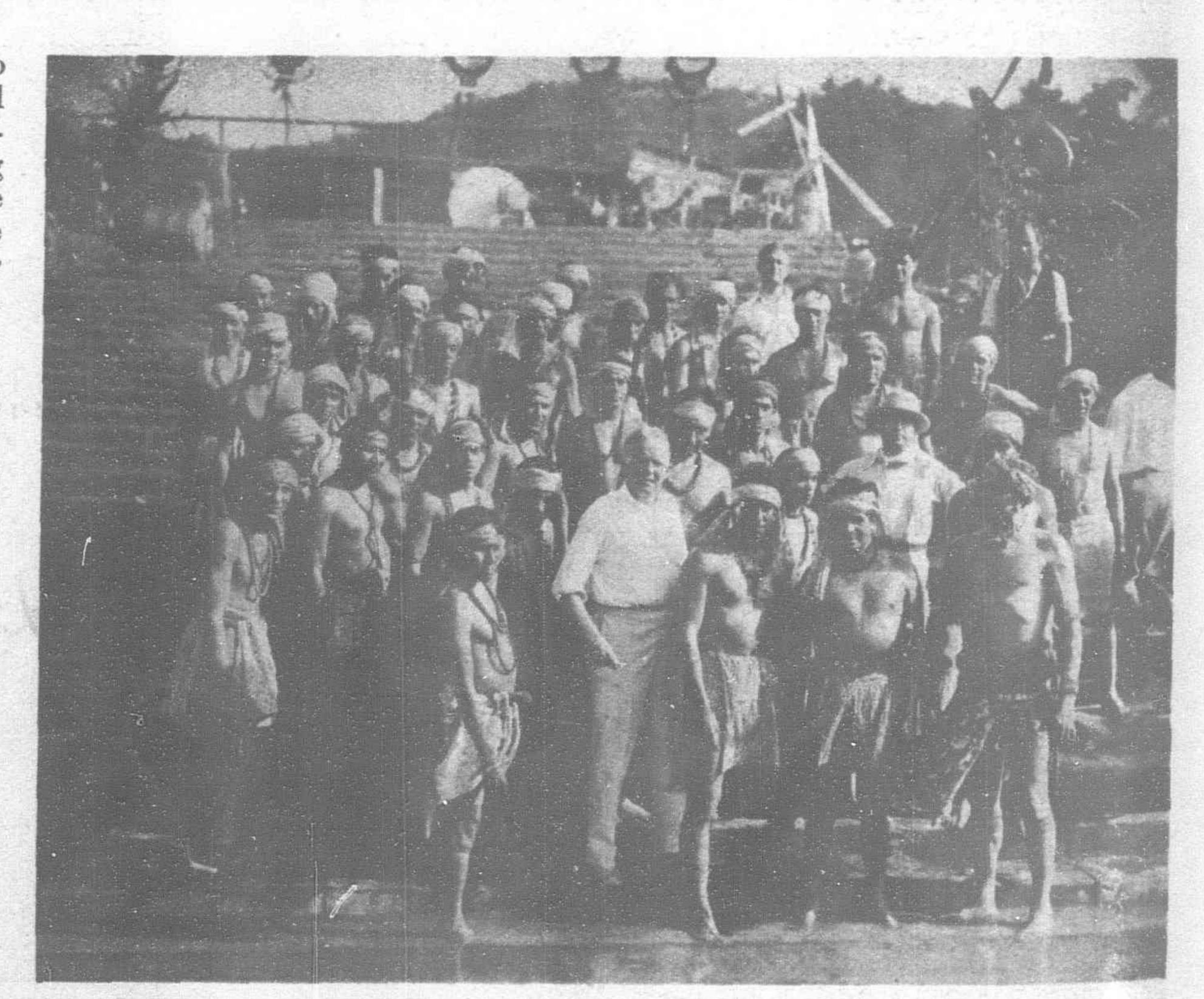
Two weeks were passed by the production unit in Quantan in filming village sequences, after which an available jungle location was searched for which would be appropriate for the following sequences. This spot was located upriver from Quantan three hours by boat. In order to get there, it was necessary for the staff to arise at four a.m. every morning, travel fifteen miles by motor boat, after which all of the equipment would be transferred to native rafts, and an additional eight miles negotiated before a scene was taken. It was oftentimes necessary to unload the boats and portage the cargo around some

obstruction in the water which impeded progress, after which the equipment would be reloaded and the trip continued. The same procedure applied for the return trip to Quantan, which was made each afternoon after the day's shooting was completed.

Arrangements were made for transporting the exposed film from Quantan to Singapore which are of interest. Each night a car was despatched for the railway terminal, approximately one hundred miles away. The film would be put on the



A scene from the Universal production "East of Borneo" photographed on the actual location in Asia



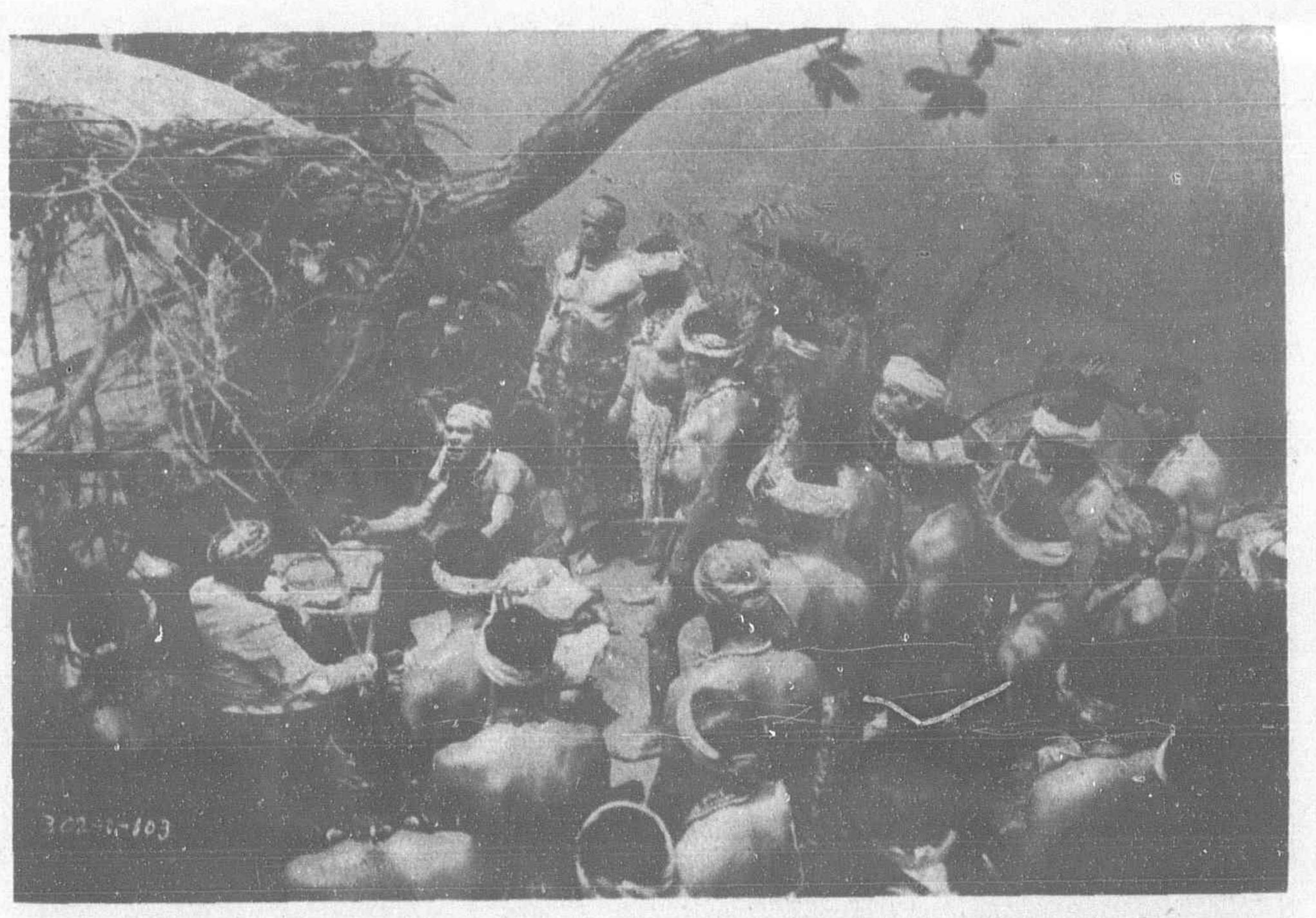
George Melford, director with some of the natives used in the Universal picture, "East of Borneo"



Romantic-About to film a night scene for Universal's strange Far Eastern drama, "East of Borneo," featuring Rose Hobart and Charles Eickford. The microphone may be seen at the left



Rose Hobart, in a scene with a group of natives. From the Universal production "East of Borneo," photographed on the actual location in Asia



A scene from the production "East of Borneo" the filming of which took place on the actual location in Asia



Natives appearing before the camera for Universal production "East of Borneo" filmed in Asia

morning train which arrived in Singapore about seven that evening. The laboratory technicians then immediately put the film into the developing solution, continuing the developing process on into the night until complete.

Sound equipment necessary for recording alone weighed over two thousand pounds, and there was nearly as much camera equipment as well as the assorted accoutrement necessary for successful filming of the picture. It was necessary that all of this equipment accompany the production unit to each shooting location, consequently transportation difficulties many times become troublesome. It was with real relief that the scenes at Quantan were completed and a return to Singapore effected.

Three Bell and Howell cameras and an Akely Sound Camera comprised the camera equipment. The sound recorder was an innovation sponsored by the Electrical Research Products, Inc. (subsidiary company of the Western Electric Co. handling sound

motion picture equipment) and embraced constructional features which had so far never been included in recording apparatus. In order to understand the completely new features of the device, certain facts pertaining to the recording of sound in the motion picture studios must be known. Recording apparatus as used in the studio falls under two general classifications—that which is permanently installed in recording rooms on the sound stages, and that which is mounted on motor trucks for use on locations away from the studio. The portable recorders are mounted on ten ton trucks, and consist of a complete outfit for recording sound in synchronism. They are bulky, extremely heavy and rather delicate. All of these features made the portable outfit as used generally unsuitable for an expedition such as was contemplated into Asia. It is the common studio practice also to expose the picture upon one film and the sound track upon another, these two films running at a synchronous speed (the camera and sound recorder being electrically driven by small synchronous motors which keep both machines always running at the same speed) insuring that at any position on the two rolls the sound and action will correspond. These are carried through the cutting and editing process on separate film, after which, as a final step the sound and action are printed onto one film. This film, which is the regular release print as used in all theaters equipped for projecting sound on film (as contrasted to the so-called sound on wax, or disc recorded sound), is known as a "composite print." However, the film in the Akaley Sound Camera was at exposure identical in form with the usual release print,—that is, the sound and action were exposed simultaneously

upon the film. This was an entirely new set-up of apparatus, and although it simplified problems of transportation and cut down considerably on the amount of necessary apparatus, certain features made its action "under fire" questionable. Of course, the equipment was tried out in the laboratory and under routine operating conditions, but no one was able to foresee the difficulties which might arise and which might complicate the operation of the equipment in the field. The remoteness of the location made the entire success of the expedition as far as recording was concerned depend entirely upon the skill with which the two sound technicians met difficulties. The fact that they brought back over ninety thousand feet of sound track which compares favorably with any recorded in the studio might be considered sufficient commentary upon their ability to meet and cope with any situation as it arose.

Necessary amplifiers and complementary equipment to the recorder were placed in heavy cases so built to withstand the rigors of jungle travel. These individual items of equipment were connected to each other by heavy rubber covered cable, making it possible to set up the camera and recorder some distance away from the associated apparatus if desired.

Sound, being extremely new as applied to motion pictures, like Topsy "just grew," hence there are many items used in recording which will in time be improved. The advent of recorded sound to motion pictures caught the industry unaware—the order of the day during those first eventful weeks following the announcement of the Vitaphone by Warner Brothers being to get sound recording equipment installed and installed quickly. There was no time then to test various alternate equipment—to spend long hours in research and in designing specific items of apparatus. Consequently the equipment as developed at that time leaves

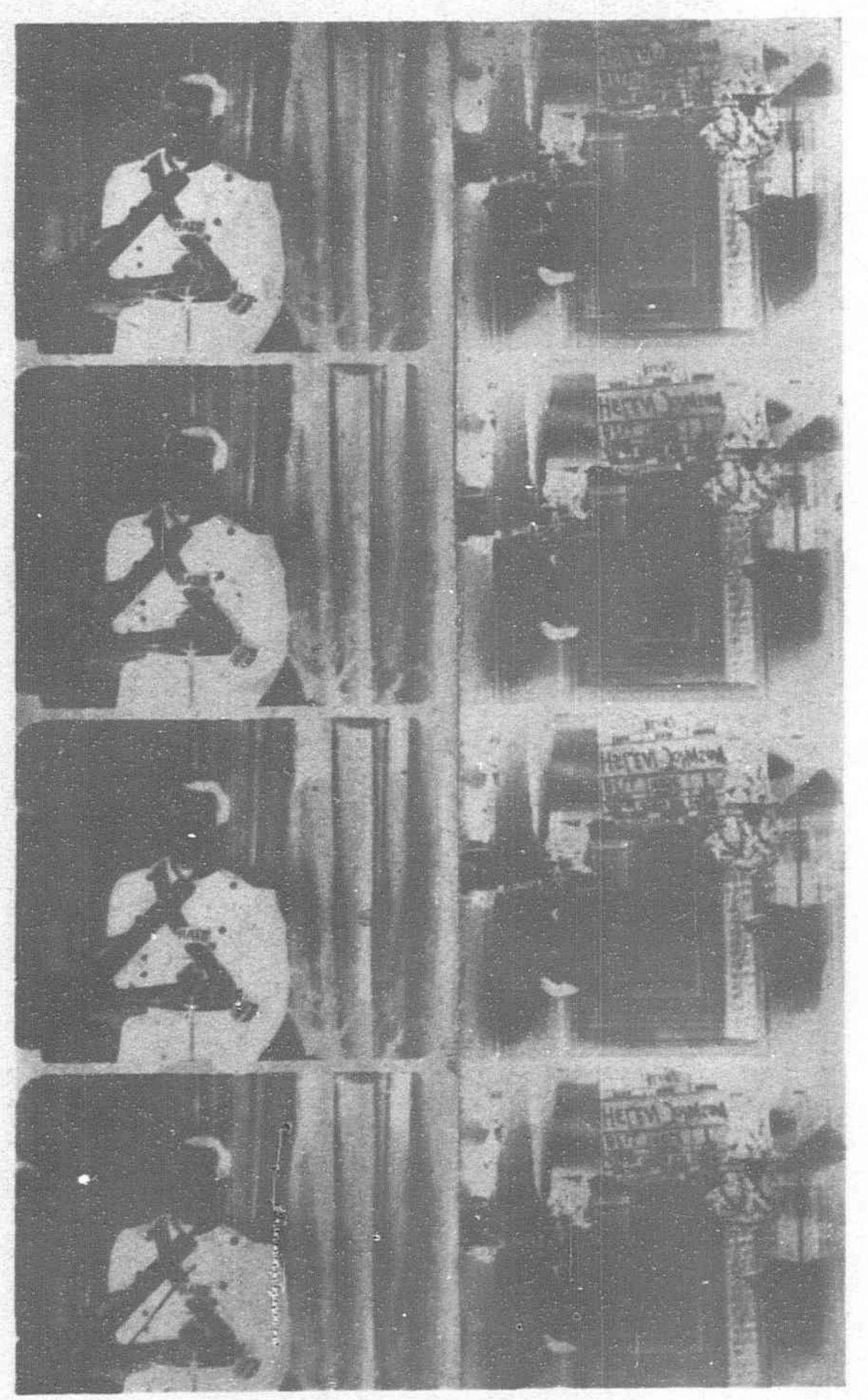
much to be desired from an engineering standpoint. The cumbersome truck mounted portable recorder described above is a case in point. The trucks are extremely mobile, large it is true, yet very flexible of operation, and although they will go anywhere that it might be reasonably desired to record sound, the shipment of a truck mounted recorder to Asia was out of the question. The design of suitable equipment for the expedition was placed in the hands of the Electrical Research Products, Inc. and the outfit as turned out by them can be considered, in retrospect, as eminently satisfactory.

The actual handicaps under which sound is recorded in distant countries can hardly be imagined. All the more striking are these handicaps when conditions as encountered in the studio are known. Huge sound proof stages, built so that no outside sound will permeate to the interior, and treated so that sounds arising in the interior will be of optimum quality make the recording of poor sound in the studio almost unwarranted. Recording conditions are of the best. The stages are ventilated and kept either cool or warm depending upon the outside weather condition-everything contributes to the making of excellent recordings. Such were the conditions under which Messrs. Cobb and Feichter operated previous to the start of the expedition.

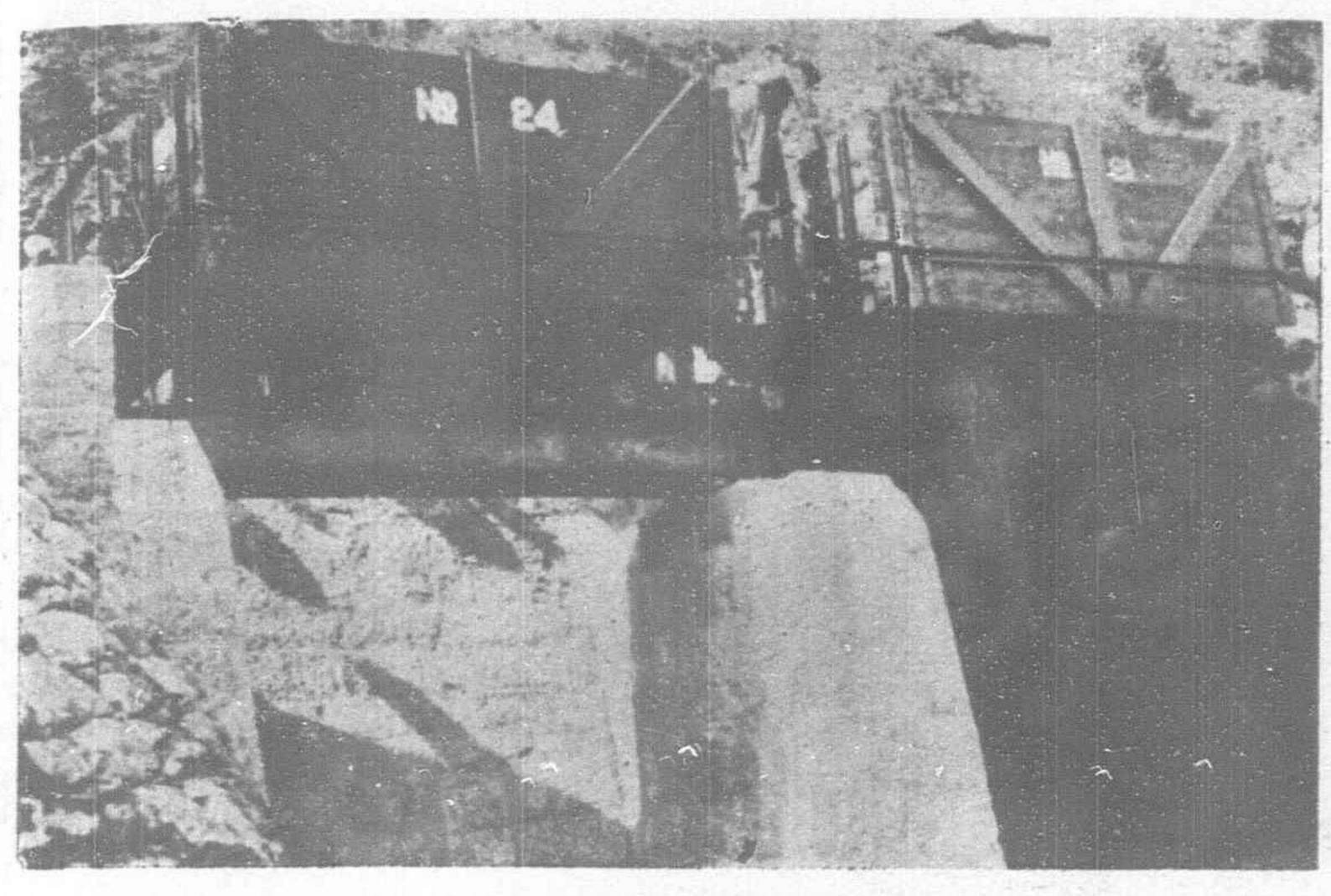
Extraneous noise presented probably the most troublesome of the difficulties encountered in the jungle. At times, it was almost impossible to record acceptable dialogue above the roar and chatter of some nearby river as it tumbled over the rocks. The super-abundance of small animal life at other times made recording all but impossible. When the company would first make their set up in the jungle, everything would be quiet. After a short

time the chatter of birds and monkeys and the buzz of insects would begin, gradually growing louder until the noise entering the microphone would all but drown out the desired dialogue. Someone on the company would then make a great disturbance, which would frighten away the small visitors and quiet them down for a time. Soon losing their fright, they would again approach and the noise would gradually increase until it would be necessary to frighten them away again. This continued throughout the days in the jungle. A certain species of bird encountered throughout the Malay States, which emitted a steady buzz by tapping the tree trunk rapidly with its bill, was particularly troublesome "for sound."

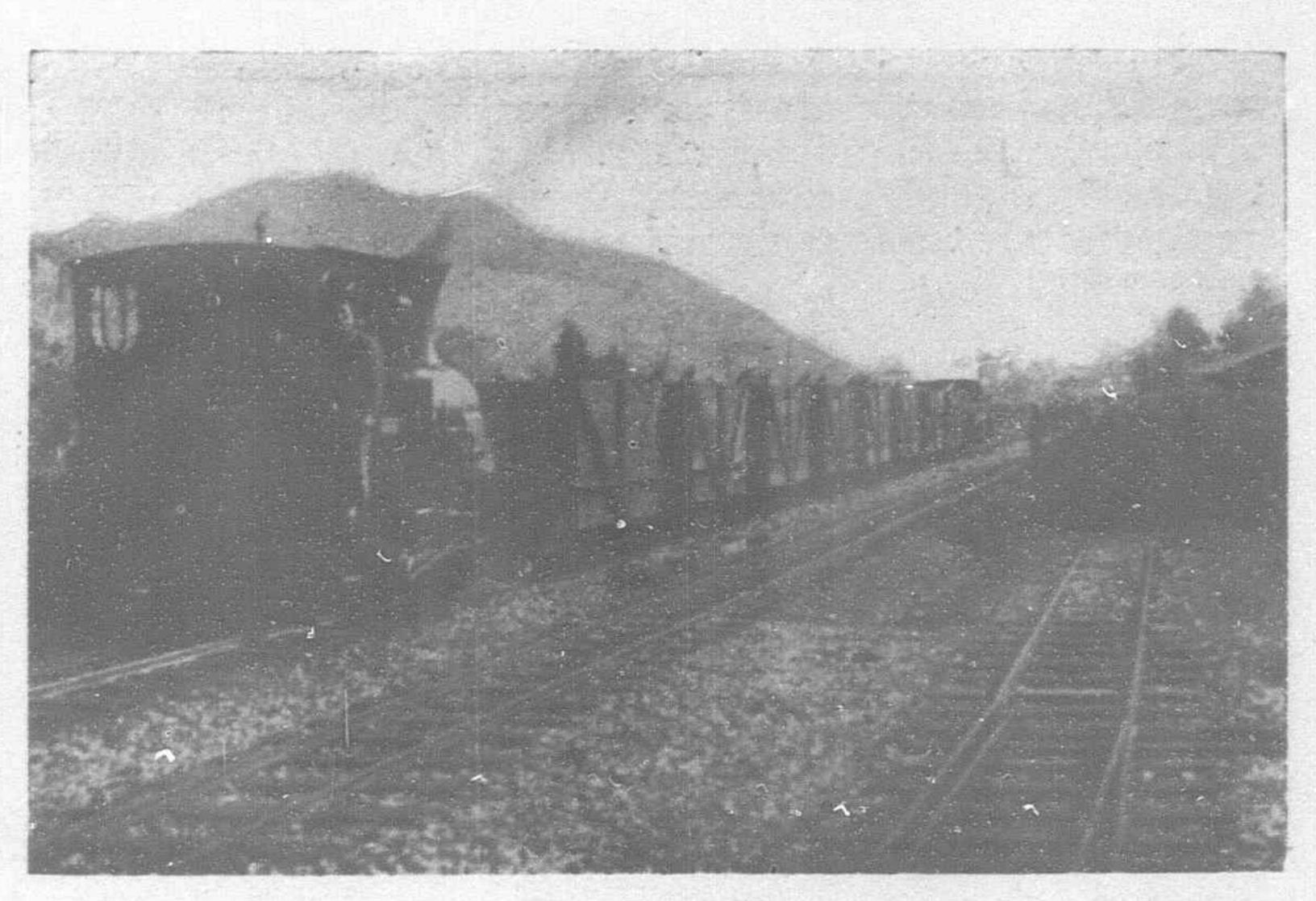
The extreme humidity of the regions affected the condenser microphones to a considerable degree as well as all of the other (Continued on page 564)



Here are pictures of the Actual Sound and Motion Film as exposed in the Orthodox Manner in the Studio. The Sound Track is exposed in the Recorder, while the Picture is exposed in the Camera, these two pieces of equipment running in synchronism. Sound and action are exposed on one piece of Film simultaneously. This is accomplished by a specially built Recorder constructed so that the Camera and Recorder form a single piece of equipment with the Recorder built on the back of the Camera, the Fi'm being threaded through the Camera in such a way that after passing before the lens it continues through the Camera and into the Recorder where it is passed before the "Sound Gate" before passing on to the "Exposed Roll."







A pretty good Job

The Only Railway in Szechuen

By HAROLD R. ISAACS

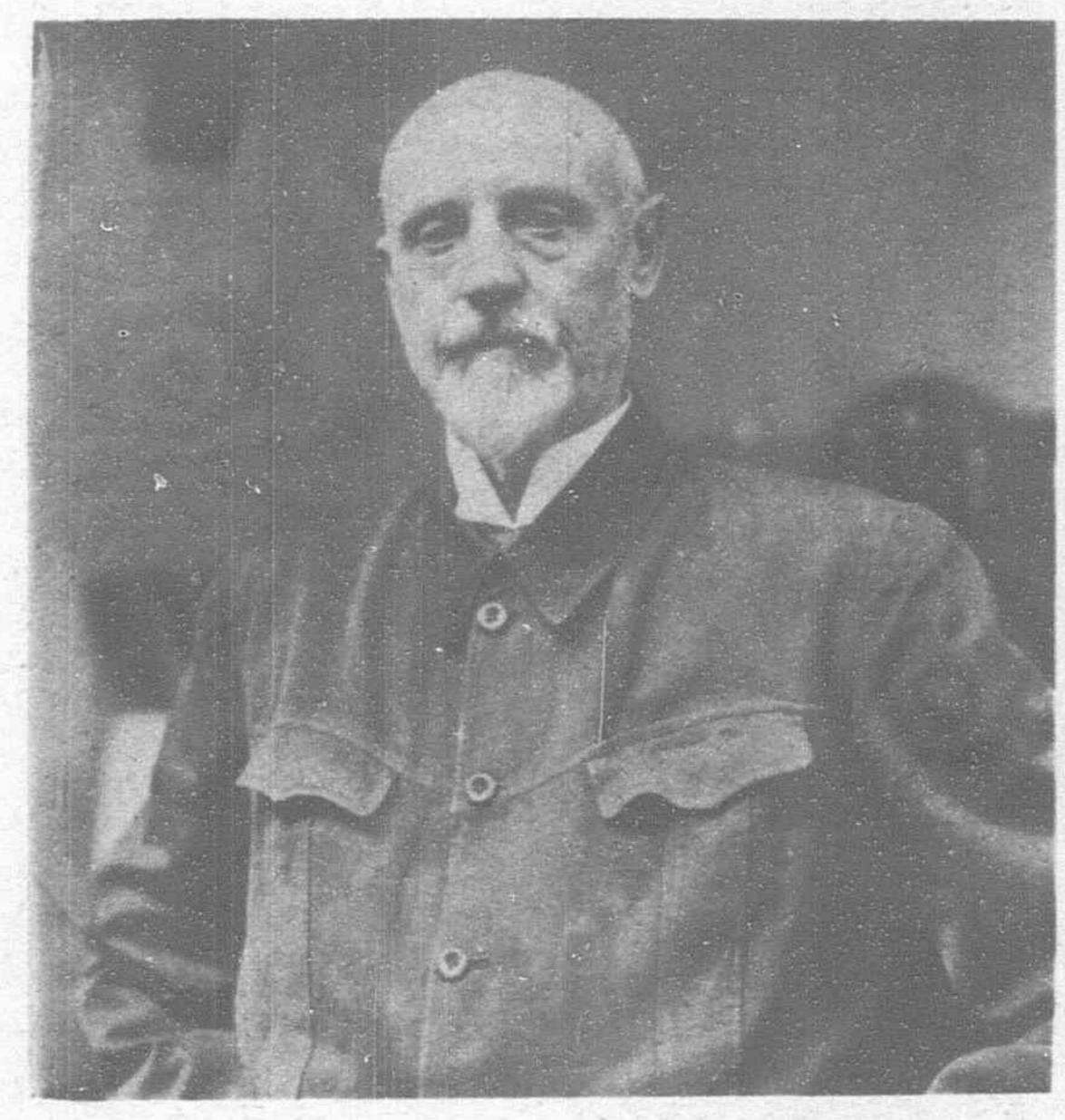
or nearly two years the only railroad west of Hankow has been puffing daily along its thirty li of rails not far from Chungking. Its existence is known to few and unsuspected by most—but there it goes tooting through country trod in the dreams of many an optimistic rail surveyor but otherwise still untouched by the engineer. Ten miles of two-foot rails are all to be found in the province that twenty years ago buzzed with plans for rail links connecting Burma and Tibet to Szechuen, which is still buzzing with the memory of the famous Chengtu-Hankow fiasco, where talk of ambitious railroad projects is still heard.

There are four toy engines pulling little toy cars from coal mines developed in a vast field on a miniature scale. But because it is the only such in all the vast miles from Mongolia to the Himalayas and from Hankow to Tatsenlu and endlessly beyond, its story seems worth

telling, especially since no full account of its existence ever seems to have found its way into print.

Fathers and beneficiaries of the project are a doggedly persistent group of Chinese interested in mining coal. Builder and chief reason for its success is Herr Jesper Shultz, 66-year old Danish engineer whose shining white beard and bright bald pate still glow with the enthusiasm of a young engineer on his first job. Shultz is still on the ground surveying the proposed route of the line's extension.

The existence of the Peh Chuang railway is part of the history of coal mining in the Kiang Peh district of Szechuen, whose boundaries carve a considerable slice out of the eastern



Jesper Shultz, 66-year old Danish Engineer, builder of the Railway



Shultz and his associates on the day the railroad began operation in October, 1929. The engine is one of the original British engines brought out thirty years ago—and now in use

portion of the province bounded on the west by the Kialing Ho and on the south by the Yangtze River. Sailing up the Kailing from Chungking 60 miles or 120 li to a point just below Pei-Pei through country where automobiles are still unknown and the river motorboats are still curiosities, one is likely to hear the unexpected blast of a locomotive siren, to see curling around the top of a hill the utterly incongruous sight of a tiny train weaving like an insignificant caterpillar to the summit. It has been there less than two years but its history goes back more than thirty.

At about this point but sixty miles north-east of the river bank a peak known as the Hwa-ying-shan noses up from the ground forming the keystone of two low but long ranges which extend from it in relatively parallel lines, known as the Eastern and Western Ranges respectively, both bisected by the Kialing. On the eastern

range, nearer the Yangtze but only fortyli from the Kialing riverport of Shih-chi-ku, is the Lung Wang Tung mine, source from time immemorial of coal used by the local natives.

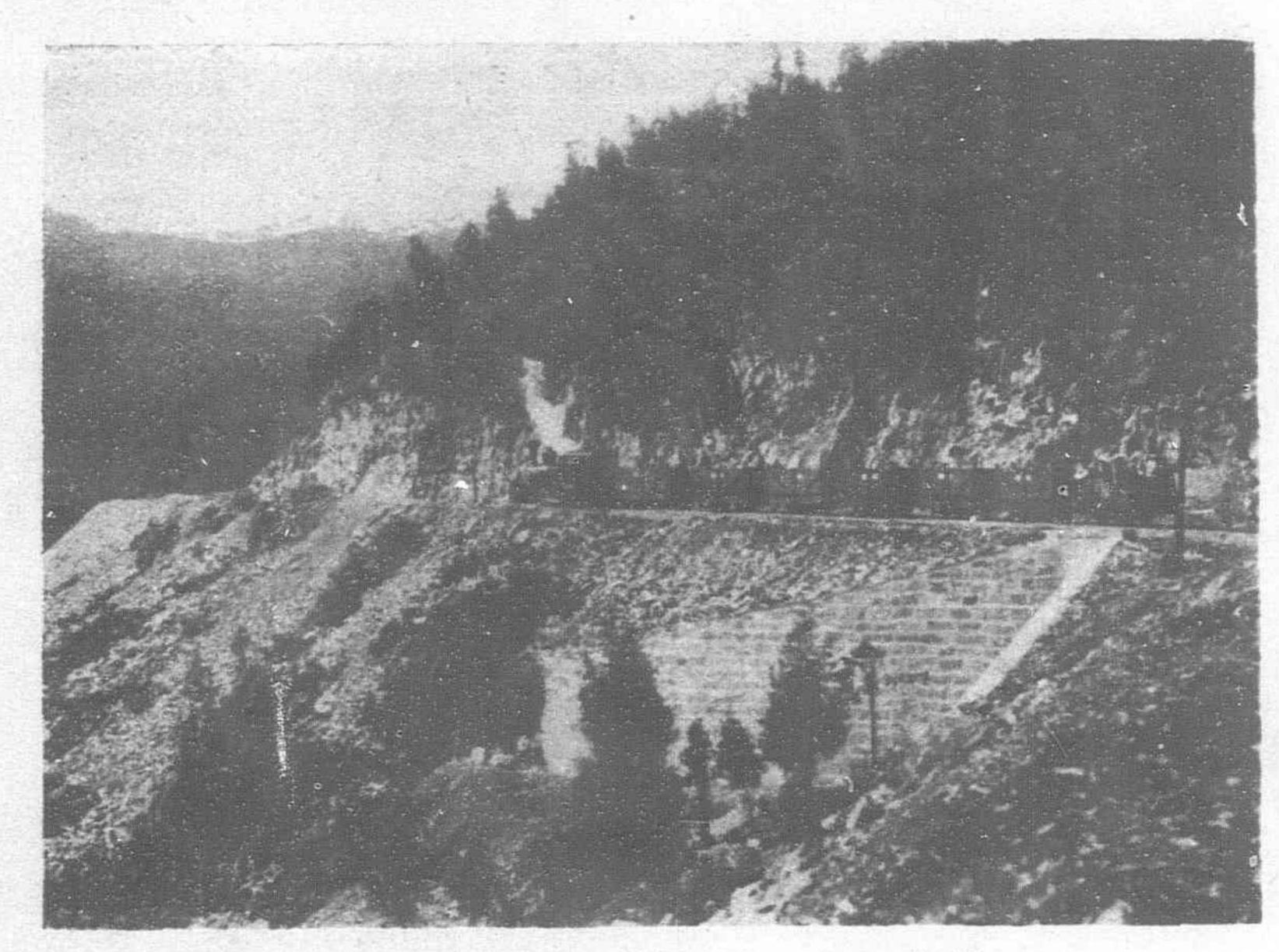
In 1897 two Englishmen arrived in Szechuen and presented the local governor with a writ from the Imperial Government at Peking giving them the privilege of mining coal and opening new developments in both ranges emanating from the Hwa-ying-shan for a distance of 200 li from the town of Kiang Peh to Ho Twanhsien. They formed into the Hwa Yin Mining Company for that purpose.

The writ they possessed contained one condition: that they could not take over without purchase any mines then

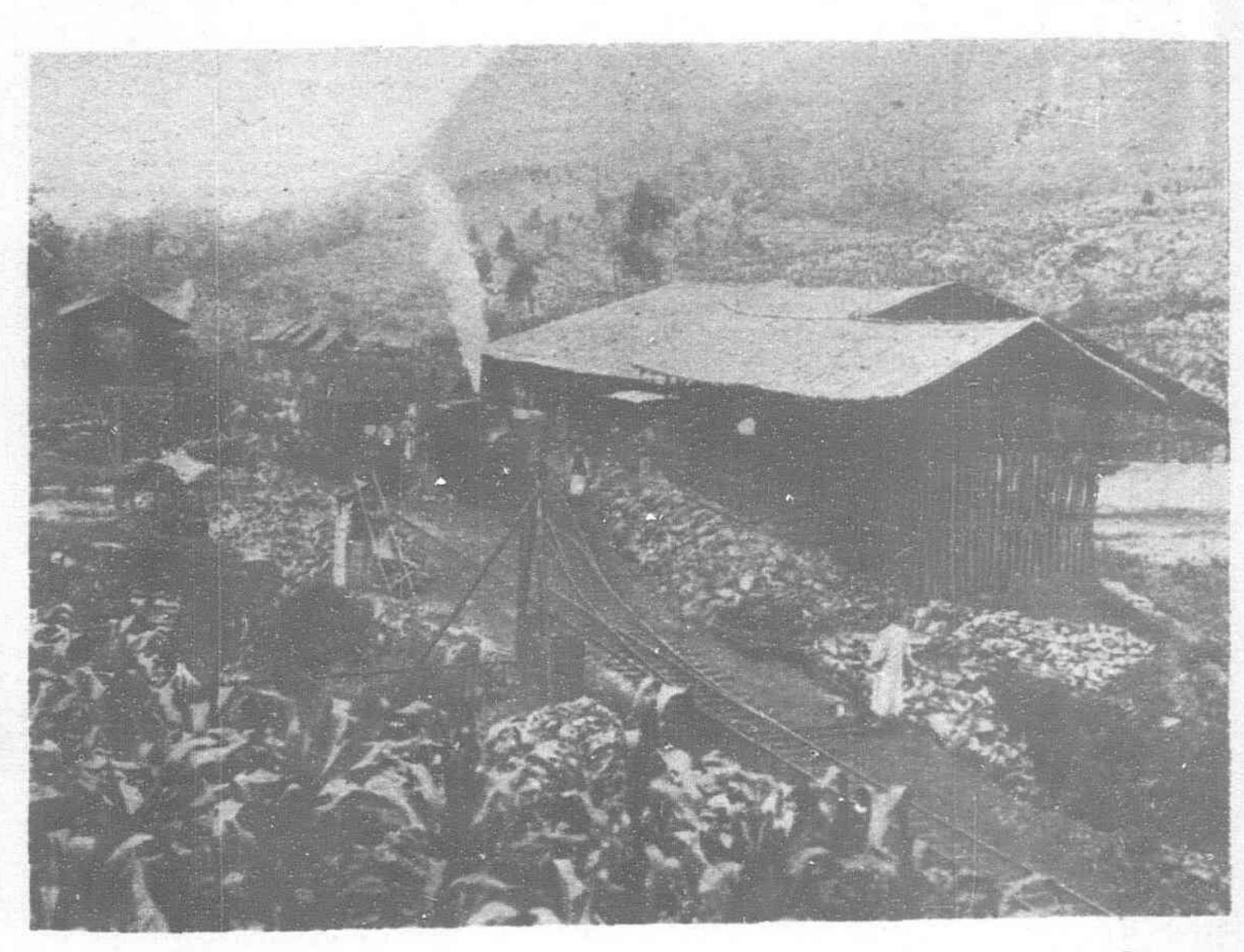
already being operated by local natives. They purchased the Lu Wang Tung, spent most of the next four years surveying the ground for a railroad from the mine down to Shih-chi-ku, a distance of 40 li.

Meanwhile two locomotives, 40 li of 20 lb. rails of 24-in. gauge, iron sleepers and repair equipment were brought out from England

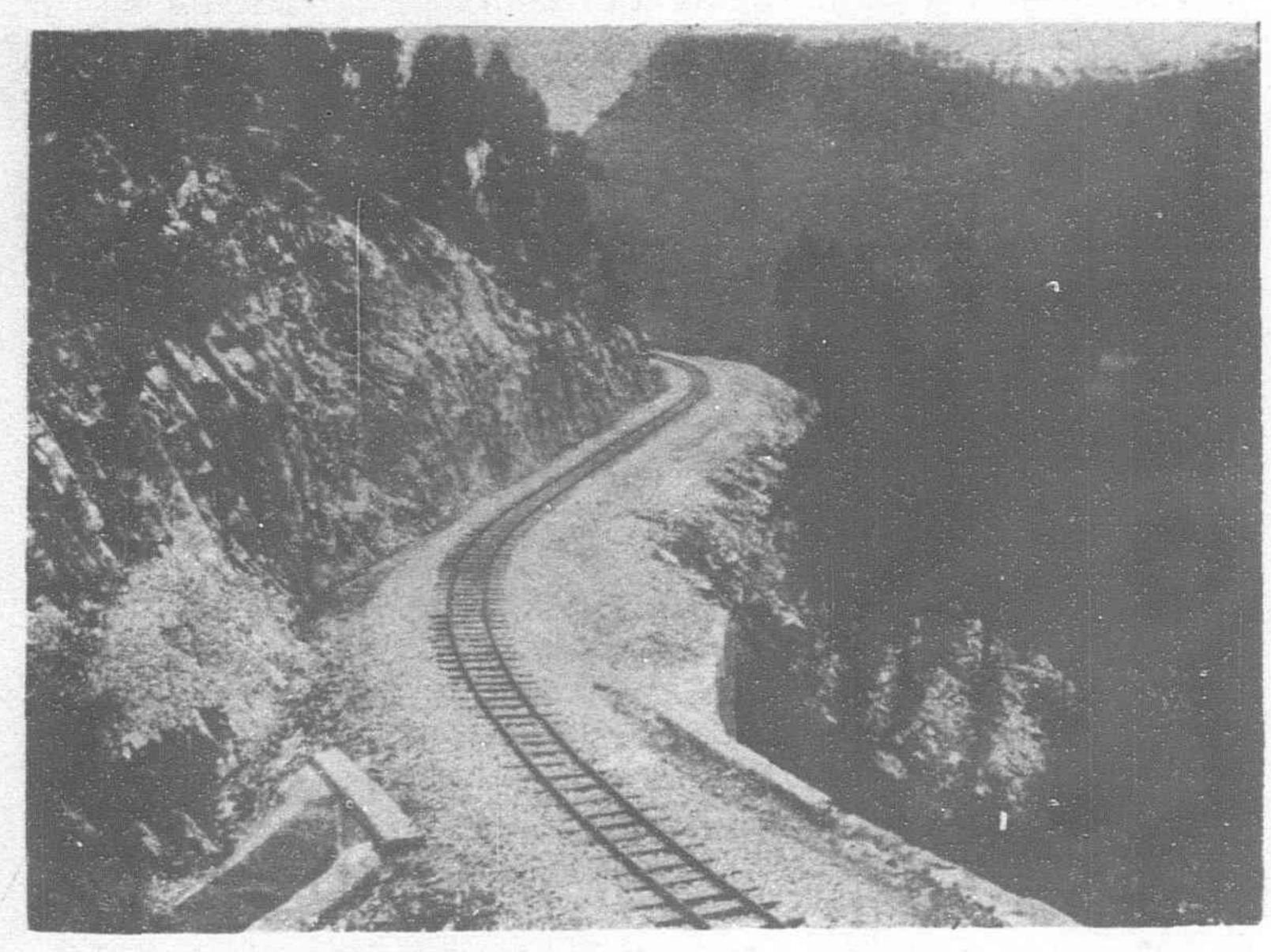
and after endless months were brought up in junks from Ichang and deposited on the foreshore at Shih-chi-ku. The purchase value of the equipment is unknown but is estimated to have been Tls. 25,000. A godown was built to house the material and preparations were soon underway for initiating construction.



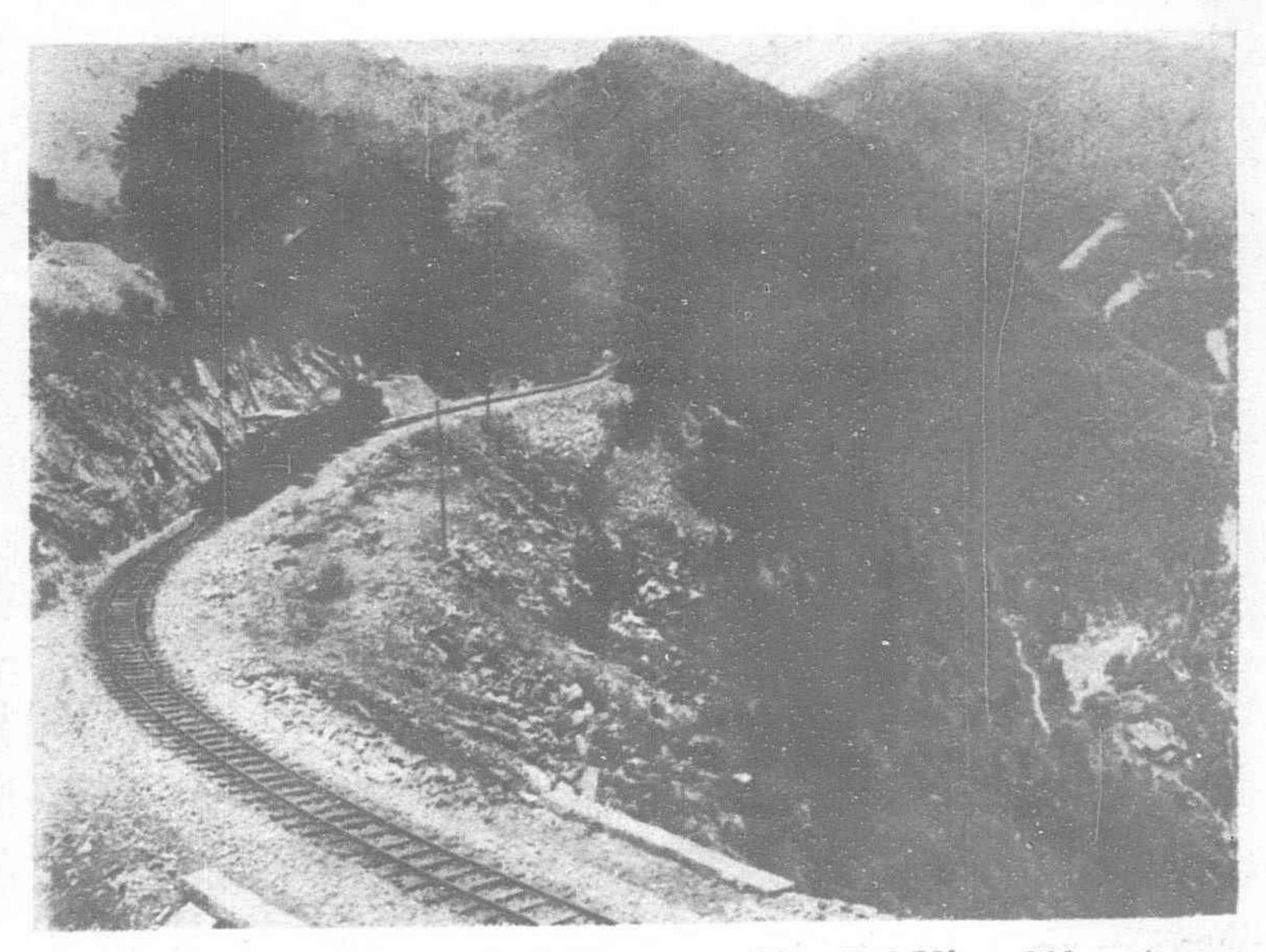
Along the grade. Note the stone bridge



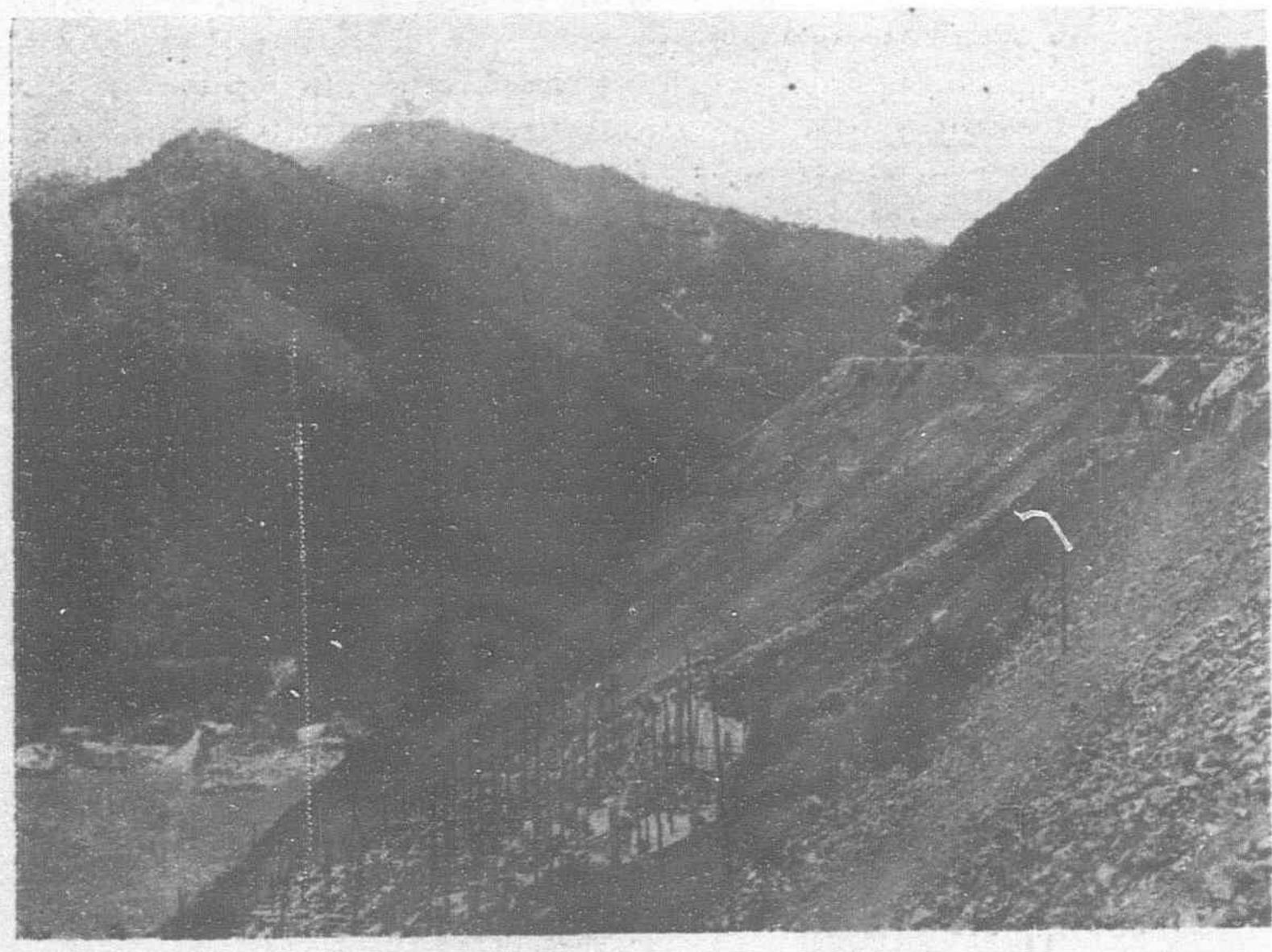
At Wen-shin-tang, changing engines in the valley for the climb



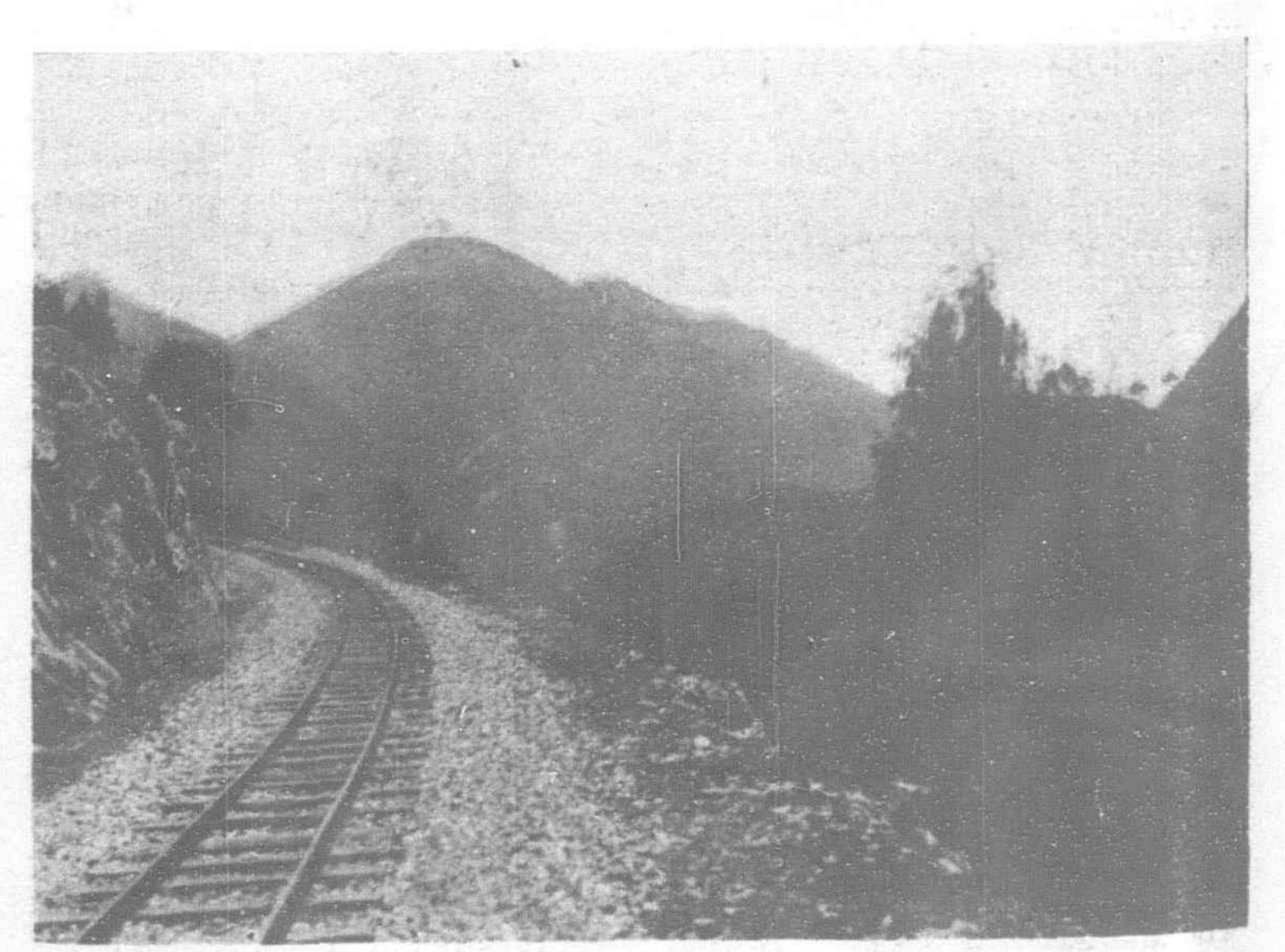
Climbing around the hill to Bei-Miao



Some idea of the upgrade pull, approaching Bei-Miao, 900 meters above river level. Buildings below mark shipping point for coal



Chute under construction at Bei-Miao for dropping coal to riverbank



On the upgrade

But the smooth progress of affairs was at an end. The Englishmen hit a snag in the shrewd opposition of certain local officials who adopted unassailable tactics to block them. They merely set the natives to work in as many places as possible breaking into coal seams and starting mines. Technically, the Peking government writ forbade encroachment on native coal preserves and the Englishmen soon found themselves hemmed in on all sides. The commissioner of the area, then known as the Twantung Tao (Eastern District), was a man named Chou Shiao-mei. By treading softly and deviously around official sanctions he soon gained his end and eventually the Englishmen had to give up the ship.

Lengthy representations were made at Peking and a protracted controversy carried on. A settlement was finally reached and approved by the Imperial Government whereby the Englishmen were to be compensated for the surrender of all their rights and equipment by the payment of Tls. 300,000. The money was soon raised by a special tax in the tao and the Englishmen left Szechuen, in 1901 to return, presumably, to England, minus considerable

energy but none the worse off financially.

For the next twenty-eight years the railroad never left the gloomy shadows of godowns, first at Shih-chi-ku, and much later in Kiang Peh. The Peh Chuang railway, conceived but unborn, suffered in silence through an inordinately long prenatal period. Meanwhile the group that was eventually to save the womb from

becoming a tomb was introduced into the coal situation.

Shortly after the Englishmen left in 1901, a number of Chinese formed the Kiang Ho Coal Mining Company and bought the rights won by the English from the Szechuen Provincial Government for Tls. 70,000, which included all the railway equipment. Thus their original capital of Tls 100,000 was cut to Tls. 30,000 and with this money operations were begun at the Lu Wang Tung. The coal proved to be of excellent semi-bituminous quality but only little could be done to increase the output. The market was still confined to local users.

During the next nine years coal was mined (as it is still being mined) in a fashion changed but little from the usages of centuries. Carrying coolies were able to make one trip daily over the 40 li down to the Kialing where the coal was loaded on junks and carried to cities below. Then 1911—the half-strangled birth of a new

world in China.

After that steamers operating on the upper river became more numerous and it was soon found that the coal was an excellent fuel for boiler use. There were some years of grace during which coal was taken out in greater quantities and distributed to steamers at Chungking, Wanhsien and Ichang. But by 1919 a long series of

troubles with briefly-reigning military men began.

General Lu Sz-ti and his able cohorts trumped up a long term tax charge against the company, arrested its managers, confiscated all papers and occupied the mine. Mined coal to the value of Tls. 100,000, a fine of an additional Tls. 100,000, with interest compounded to a total of nearly 100% brought the subsequent losses to nearly Tls. 300,000. When the cash was paid in the officers of the company were released from jail but the mine remained in the hands of the military under whose auspices the price shot up to \$12 a ton from a previous level of \$4. During the hectic years that followed the mine fell into the lap of one warlord after another.

Repeated attempts on the part of the Kiang Ho officials to recover the mine finally succeeded in 1926 when it was "returned" to them by General Liu Hsiang, then enjoying one of his several reigns at Chungking and now enjoying his longest. Shares totalling \$40,000 were given the military, in addition to \$30,000 for alleged investments made by them. An identical settlement was made with the men who had been operating on behalf of the military and the Kiang Ho people finally recovered possession of their property after an allotment of \$140,000 in shares to those from whom it was being recovered. The firm was reorganized into the Shieh-chi Kiang Ho Mining Company and operations resumed. By that time other firms were in the field, costs had risen and things did not ride too smoothly. Attention was turned meanwhile to another field.

When the Kiang Ho Company took over the original rights in 1901 they also began operations in mines along the Western Range where a different quality of coal was available. While the Lu Wang Tung was situated in sandstone, with an 18 inch seam of comparatively non-gaseous semi-bituminous coal, the Western Kange proved to be largely limestone, rendering coal that was slacker and of a poorer quality, lending itself more to the making of coke than for boiler uses. The quantity there was tremendous,

however, and equalled only by similar deposits at Chi Kiang in the western part of the province where widely used coke of an excellent

quality is produced.

In 1919 when trouble started with the military the little developments over on the Western Range were left undisturbed. A subsidiary organization, known as the Itai Coal Mining Company was formed to operate there and work was carried on. Other groups had begun to encroach on the rights owned by the Kiang Ho and are still working mines there, although litigation is in progress somewhere in the courts.

When all the money required for the recovery of the Lu Wang Tung had been paid out the company found itself with a deficit of Tls. 70,000. This was soon covered by the slow but steady flow of coal from the Western Range and by 1929 all was in the clear. Emphasis shifted away from the Lu Wang Tung to the Western Range and it was here that plans were finally laid for the construc-

tion of the long-suffering railway.

Labor troubles developed. The mines drew their workers chiefly from among those freed from the farms by the winter. While in summer some 5,000 carriers were kept working, this figure jumped to more than 10,000 in winter. Ingenious systems of squeeze were perfected and serious losses sustained by the company. The large labor turnover soon loomed as a major problem that had to be dealt with if continued operation were to prove feasible.

From this situation emerged, at long last, definite plans and

arrangements for railway construction.

Desultory talk of building a railroad assumed the shape of direct action late in 1926. The group of Chinese business men running the Kiang Ho Coal Mining Company put their heads together under the leadership of the veteran Mr. Tong Chin-chiang. A Chinese engineer was engaged to make a survey along the Western Range for a line to serve the six mines already in operation.

His rough map and estimate, finished after three weeks in the field was rejected on grounds of what later proved to be gross inaccuracies and exorbitant price. Matters were left in abeyance until the following winter, 1927, when the group met again at Pei-Pei and decided to engage a foreign engineer to do the job. A representative, Mr. Li Yuen-kung, was sent to Shanghai. Shortly afterwards, on New Year's Day, 1928, Mr. Jesper Shultz arrived on the scene and from that date the nebulous railway project began to take form and eventually achieved under his direction the realities of clanking rails and hissing steam seen and heard for the first time on the hills of Szechuen.

Together with young and able Mr. Tong Shui-wu, nephew of the elder Tong, Mr. Shultz made a detailed and painstaking survey which he completed in March, 1928. His plans and estimates were ready two months later, calling for the construction of the line at a cost of something more than \$300,000 on a 30-in. gauge basis.

Now that it began to appear as though something were actually going to be done there was an epidemic of cold feet and a barrage of ridicule from the Chungking press. Some of the original group grew skeptical and after some complications finally withdrew from the scheme, leaving a smaller group and a depleted capital available. But Tong and two of his associates stuck to their guns. Plans were reduced to the original 24-in. gauge arrangement and it was decided

to go ahead with the proposition.

The Peh Chuang Railway Company came into existence and purchased the rail equipment, rusting through the years in godowns, for \$35,000. Two years previously Yang Sen had brought the whole lot down from Shih-chi-ku to be used for road building purposes. But meanwhile a military turnover eliminated the versatile General Yang for the time being and the equipment remained in Kiang Peh. Many of the rails had been lost and the rest had suffered considerably through depreciation. Some \$10,000 additional was spent in reconditioning and in the purchase of new parts. All was transported back up the Kialing Ho and in November, 1928, the first shovelful of dirt was turned at Wen Shin Tang.

By October, 1929, a 17-li stretch known as Section 2 was in operation and the first locomotive toot ever heard in Szechuen resounded through the countryside. It had been built on a 2% grade and completed at a cost of \$170,000. The equipment had been brought up from the river in parts, carried on the backs of hundreds of coolies. Every inch of the roadbed was turned and

graded by hand.

This "middle stretch" brought the rail line plump up against a rocky hill, at Bei-Miao 900 meters high, which was the last formidable obstacle in its path to the river which flowed past, far below, but only five li distant. Shultz took the bit in his teeth, brought up a large supply of black powder and blasted away 30,000 cubic feet of tough limestone. He constructed a roadbed around the side of the hill near the summit on a 5% grade. At a cost of only \$60,000, this stretch, called Section 1, was completed in eleven months. It began operation in February of this year.

Twenty-two li of railroad now brought the line of communication to a point only 150 meters above the river level at low water, 20 meters less in summer, and left only 300 meters over which the coal has to be carried downhill to where the junks are loading. A chute is being constructed which will eliminate most of this last

distance.

Whereas formerly 10,000 carrying coolies shouldered loads of coal over the same distance previously at the rate of one trip a day which netted them about 1,000 cash (about 6 cents big money, Shanghai), now slightly more than 1,000 men are able to make about 15 trips a day from the rails end to the water for 600 cash (a little more than 3 cents, Shanghai). These figures vary slightly with changes in water levels which increase or lessen the carrying distance but on an average the carrying coolie earns about 7,500

cash per day (about 50 cents, Shanghai).

Last year two new Orenstein-Koppel locomotives were brought out from Germany, one a 110-h.p. engine for use on the stepper grade, the other 70-h.p. on the more level section. Forty new self-discharging cars with a capacity of five tons were purchased and most of the old 1-ton cars discarded, although the original English engines are still in use along the line. The line has been extended at the far end an additional eight li and the farthest terminus is at a place called Tai-chia-gou, adjacent to the sixth mine operating in the range. Shultz, when I visited him, was preparing to set out on a surveying trip to the north-east. The line will eventually be extended in that direction for 90 li to meet the Chu Ho just before it flows past the important city of Hochow, completing a link which will in time prove an important shipping route and which will in any case be of inestimable value to the coal area through which it cuts.

The railroad, tiny as it is, represents one of the few signs of industrial progress to be seen throughout all Szechuen. If a Ming Dynasty resident of Bei-Miao were to return for a visit from that place where all good Chinese go he would be startled by the dragon on wheels but the mines would be entirely familiar. The difference in method of operation since he collapsed under his last load of

coal 500 years ago he would find negligible.

The amount of coal in the Western Range is unknown, but it is known that it was being mined there at least 1,000 years ago. Despite their operation under comparatively modern Chinese auspices, despite the progressive attitude which produced the railway, absolutely no change has been made in the mines themselves. I am not especially concerned with the commercial aspect of this backwardness, but a day spent-among the workers in those mines

left me with a bad taste in my mouth.

The No. 6 mine, for example, employs about 100 "men." More than two-thirds of them are under twelve, working both inside the mine and out and capable of earning on a time-piece work basis about \$5 a month. In the mine shaft which is hundreds of feet long, cutting a diagonal into the heart of the hill, several score of these youngsters and a few slightly older work with picks and little handcarts—with no ventilation whatever! Someone once built a huge rotary arrangement outside the shaft designed to draw fresh air down and discharge the gases from the tunnels. When I visited the mine the hand winch was thick with rust and the high, ferris-wheel like affair was covered by several inches of painstakingly woven cobwebs.

There is no machinery of any kind in the mine or out. Water is pumped up from the lower levels by crude bamboo handpumps and carried off in a rough sluice at the main level. Coal is hacked out with picks and pushed out of the mine in small wooden, wheelless cars. Here it is dumped where others sift the dust and load the heavier pieces for portage down to the rail's end a few hundred yards away. The dust is mixed with water and deposited in fifteen-foot natural ovens where the gases are burnt off and coke produced. The mine produces by this means about 100 tons of coal a day and is the banner mine of the six served by the railroad which makes five trips daily down to the river with a total portage of about 400 tons of coal.

Of the physical appearance of the youngsters at work in the mine it is not easy to write. You have read of recent exposés of child labor conditions in the United States and in England. You read Dickens on the early years of the industrial revolution in Great Britain. There has been a lot of sobbing done by child labor agitators. All of it is heavenly felicity compared to conditions in these Szechuenese mines. Black human corpses in miniature, prematurely hardened bones and muscles doing animals' work.

But the hills conceal them. The little railroad comes down along the slope into a valley which is a green and lovely garden. Corn and wheat grow in fields bordered in places by palms! Banana trees flap their huge clumsy leaves. Every last square foot is cultivated and every last square foot gives its measure of rich harvest.

Shultz has introduced into his railroad all the pomp and circumstance of a "big-time" railroad. At every stop and start whistles are blown and flags are waved. Signalmen hop up from their posts, flags at salute, as the little train rumbles by at its 20-mile an hour clip. It seemed like a game being played by little boys.

Stations are being built along the way and two crude passenger cars are always part of the outfit. A fare schedule is prominently pasted on the door but, as Shultz put it, "all the passengers so far

are part of the family."

Sooner or later Szechuen, too, may have its roaring limiteds. But for now it is content to boast of the only railroad in West China, even if it be but an infinitely small drop in the country's biggest bucket.

Speeding up the Cables

A wonderful new mechanical device to speed up the cable service is being installed at a number of Australasian stations by Imperial & International Communications, Limited. By means of the "regenerator" as this apparatus is termed, signals are automatically reinforced and flashed on from station to station. Thus, messages from London, on the London-Singapore chain now extended to Adelaide are transmitted over a chain of cables linked up by no fewer than 15 intermediate stations, and now only take three seconds to reach their destination, as against some minutes under the old system.

With the installation of regenerators at Sydney, Southport, Auckland, Norfolk Island, Suva, Fanning Island and Bamfield, B.C., the whole of the company's great network of services will have been equipped with this device, and a Pacific chain will have been established between Australia, New Zealand and Canada.

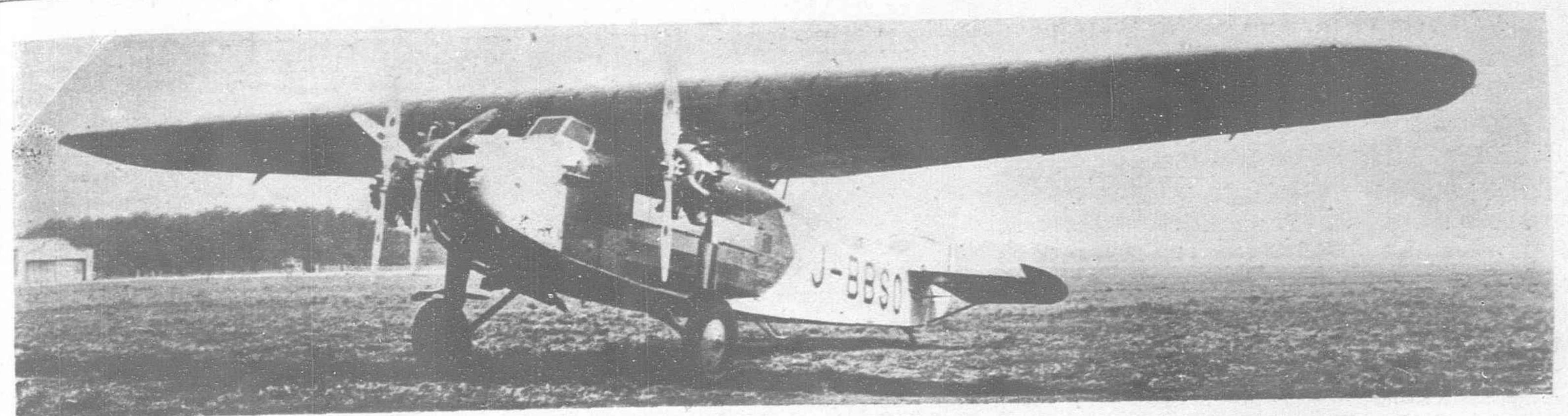
Similar improvements are also to be carried out at Porth-carnow, Fayal, Harbor Grace, Halifax, and Montreal, for the setting up of a double chain between London and Canada. Connections between these and the Pacific chain will be effected via the trans-Canadian land lines.

Import of Machinery into the U.S.S.R.

During the past two years the imports of machinery into the U. S.S.R. has grown as follows: 1929—178 million roubles, or 7 per cent of the world export of machinery, and in 1930—381 million roubles, or 15.5 per cent of the world export. In 1929 the U.S.S.R. ranked third amongst machinery importing countries, following Canada and England, whereas in 1930 the Soviet Union held first place. It is interesting to note that whereas in 1930 the world's trade in machinery declined by 10 per cent, imports into the U.S.S.R. comprised approximately 15 per cent of the world's export of machinery. In 1931 the relative importance of the Soviet Union as a machinery importing country will considerably increase as a result of the absolute growth of Soviet imports and the sharp decline in the purchase of machinery by all other countries.

The importance of the U.S.S.R. as an importer of machinery is evident particularly in the case of tractors for which the Soviet Union at present represents the only big market capable of maintaining the American tractor export at its previous level, as neither Canada, Argentina nor Australia are at present able to buy any considerable quantities of tractors.—*Economic Review of The*

Soviet Union.



Wright Whirlwind 6 Type 225 h.p. Tri-motored plane to be used in the proposed Japan-Taiwan Service

Commercial Aviation in Japan

By EISABURO KUSANO

ommercial aviation in Japan is now an established industry. The number of passengers carried as well as the mileage covered in scheduled flights show steady and rapid increases. Too, the percentage of flights on scheduled lines has materially improved.

All told Japan has nearly 4,000 kilometers of established commercial airways operated by five organizations regularly, and their combined annual flights total nearly 2,000,000 kilometers. These figures will shortly be increased greatly in view of the fact that the Japan Air Transport Company is planning to open new lines to Taiwan (Formosa) via the Loochoo Islands, and also to Aomori, the northern end of the Main Island. Furthermore, the company is ready to launch its long projected Osaka-Shanghai Line as soon as the Chinese National Government of Nanking gives its consent to the Japanese inauguration of this line. In point of fact, the company conducted a number of successful test flights between Osaka and Shanghai in the early part of 1930.

In addition to the five organizations that operate regular lines on fixed schedules, there are scores of aviation schools all over the country. These schools, besides sponsoring training flights, undertake all branches of casual commercial aviation, from air displays for advertisement purpose to the search from the air for fish schools over the sea, in addition to passenger and freight transportation.

According to investigations made on October 1, 1930, there were 121 civil airplanes, registered and in fit condition in Japan. Of these, 26 were hydroplanes, the remaining 95 being land planes. Of the latter, there were nine which could be operated for stunt flying.

Simultaneous investigations revealed that there were 231 aviators, 121 pilots, 100 mechanics, and three free balloon operators on the active list.

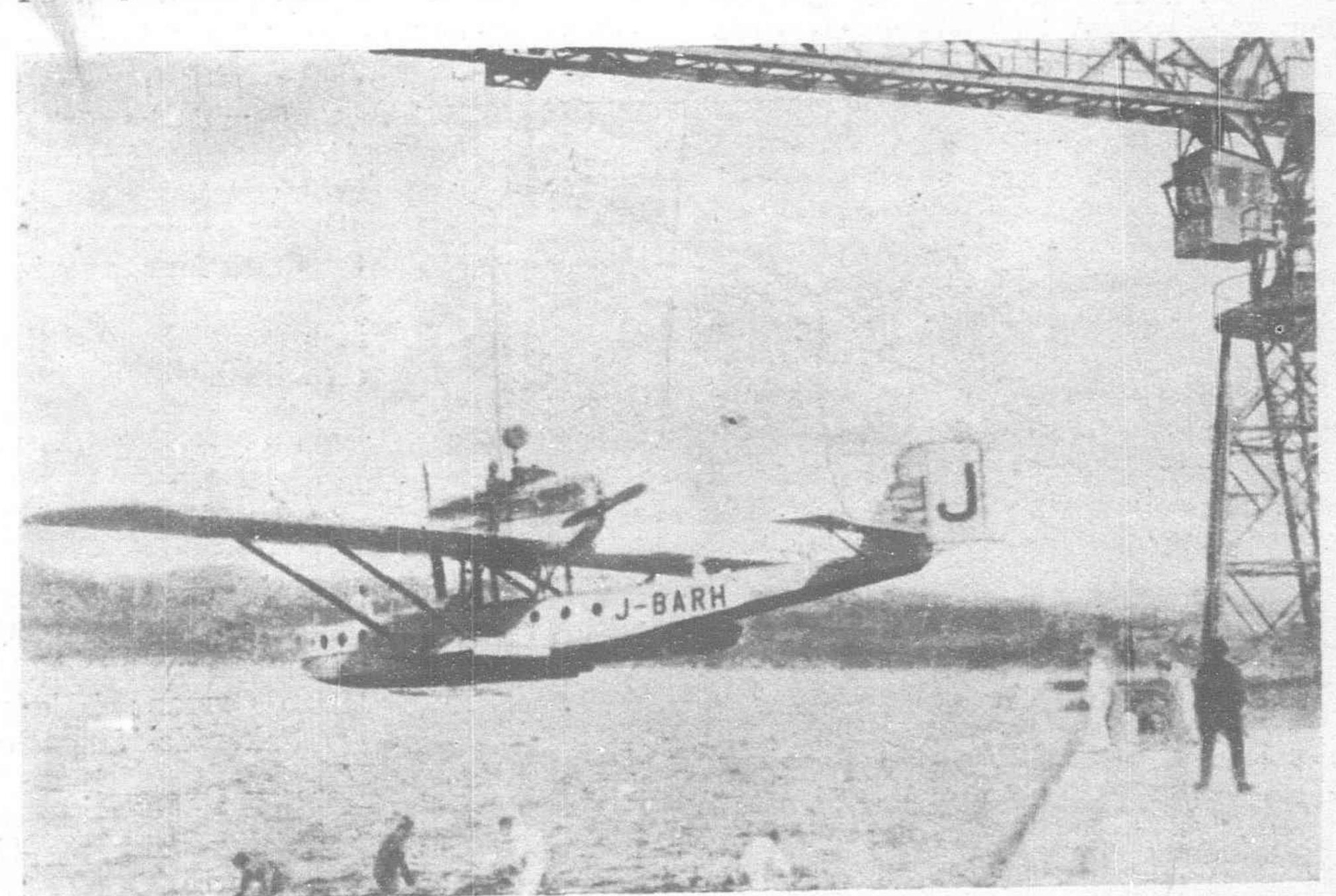
The Japanese regulations governing aviation stipulate that if any airman passes six months without once flying, he must undergo an official test flight to demonstrate

his technical ability before he is permitted to make any public flight. Flyers on the active list, therefore, mean here those able to assume duty without undergoing such official test flight. Of the foregoing flyers, there were 148 "A" and 83 "B" class aviators, 20 "A" and 101 "B" class pilots. The difference between the aviator and pilot as classified here is that the former is in charge of the operation of the aircraft while the latter concentrates his attention on aerial navigation by doing such work as observation of positions, fixation of route, and the like. Mention must also be made of the fact that most of the aviators qualify themselves as pilots, and therefore, the total of these aviators and pilots are much larger in number than the actual number of flyers.

There are two courses for laymen to become fliers and aerial mechanics in Japan. One is to learn the art at aviation schools and the other is to become special students of the Aviation Board of the Department of Communications. To explain the last named system; a would-be flier or mechanic takes physical and scholarship examinations of the Aviation Board to become the special student of the Board. He is then sent to the Naval Air Corps at Kasumigaura or to the Army Aviation School at Tokorozawa to be trained. In the case of a candidate for the post of air mechanic, he is sent to whatever civilian factory the Army authorities may appoint, although at present they are sent to the Tokyo Prefectural

Engineering Handicraft School. During their study, flier students get a monthly allowance of Y30 while the mechanic student gets Y40 a month.

Upon completion of their work, the flier student qualifies himself for "B" class aviator. He is under no obligation to serve at any place, although he may stay with the Navy or the Army corps as a non-commissioned officer with possibilities of being made an officer, all depending upon his good record. As regards the mechanic students, they get certificates testifying that they are full-fledged aerial mechanics upon completion of the course.



Najima Airport, suburbs of Fukuoka near Kyushu Island opened as an International Airport belonging to Aviation Board of Department of Communications. It will be an important point on the route from Osaka to Shanghai

The accident cre-

ated a considerable

sensation all over the

country. Nevertheless,

the Osaka bound pas-

senger plane that left

Tokyo the following

morning carried a ca-

pacity list of passengers,

this circumstance testify-

ing to the fact that

the public trust in the

safety of the air journey

had suffered nothing

the five organizations

A brief account of

from the disaster.

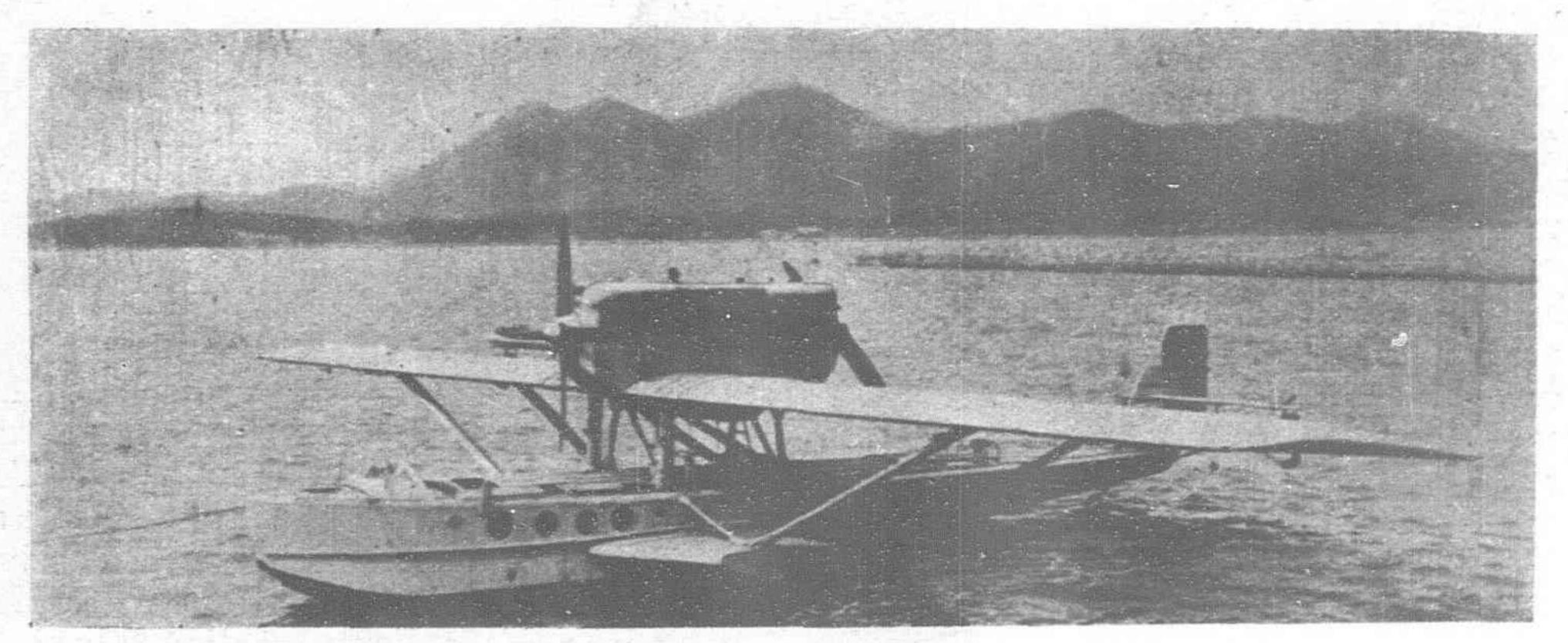
Since the Aviation Board inaugurated this system in 1921, 94 students have been placed either with the Army or the Navy for desired training up until 1930. Of these, one died while in training, five gave up before graduation, and four were still under training in 1930. Fourteen of them died after graduation in accidents and two became invalids. The remaining 68 are now engaged either in civil or military service, although some of them found posts with the Aviation Board after graduation.

As is seen in these explanations, there are three groups of fliers in Japan. The one group is composed of those who studied at private aviation schools, another group is composed of those who studied either at Navy or Army camps, while the third is made up of those who learned abroad. With the recent rise of the university student airmen, there will be a fourth group in the near future.

Generally speaking, the Japanese as a nation are now air-minded. A remarkable illustration of this was witnessed toward the end of June this year when a passenger plane of the Japan Air Transport Company fell and burned, the accident resulting in the death of the aviator,

mechanic, and a passenger. This is the first accident that has occurred to a passenger airplane on schedule flight since the

Company opened the service in July, 1929. Fog and bad weather are blamed for the disaster; the ill-fated ship was a Fokker Super-universal sixseater, equipped with a Jupiter 420 h.p. motor, built and purchased from the Atlantic Aircraft Corporation of the United States. The plane was caught in a fog and lost its way in the neighborhood of the Hiyamisu mountain path in the northern part of Kyushu Island



A Dornier Wal Plane equipped with two B.M.W. 600 h.p. Motors to be used in Japan-Taiwan Service

on its way to Osaka. It crashed into the mountain side, and tumbled down into a valley burning. The solitary passenger had

that operate regular air services, as well as some of the aviation schools that undertake casual commercial flights, will be given by way of describing the present condition of Japan's civil aviation.

It must be stated, however, that the Japan Air Transport Company is by far the largest and the most influential of all and that its operated airways are more than twice as long as those of the other four organizations that run regular air services. Annual flights of this Company exceed in mileage those of the four other organizations combined.

The Japan Air Transport Co., Ltd. (Nihon Koku Yuso Kabushiki Kaisha)

Established: October 20, 1928.

CAPITAL: Y.10,000,000.

CAPITAL, PAID UP: Y.3,999,362.5 (March, 1931).

HEAD OFFICE: Hikokan, (The Aviation Hall),
Sakurada-Hongocho, Shiba-ku, Tokyo.

BRANCH OFFICES:

Tokyo airport, Tachikawa-machi, Tokyo suburbs.

Osaka airport, Funa-machi, Minato-ku, Osaka.

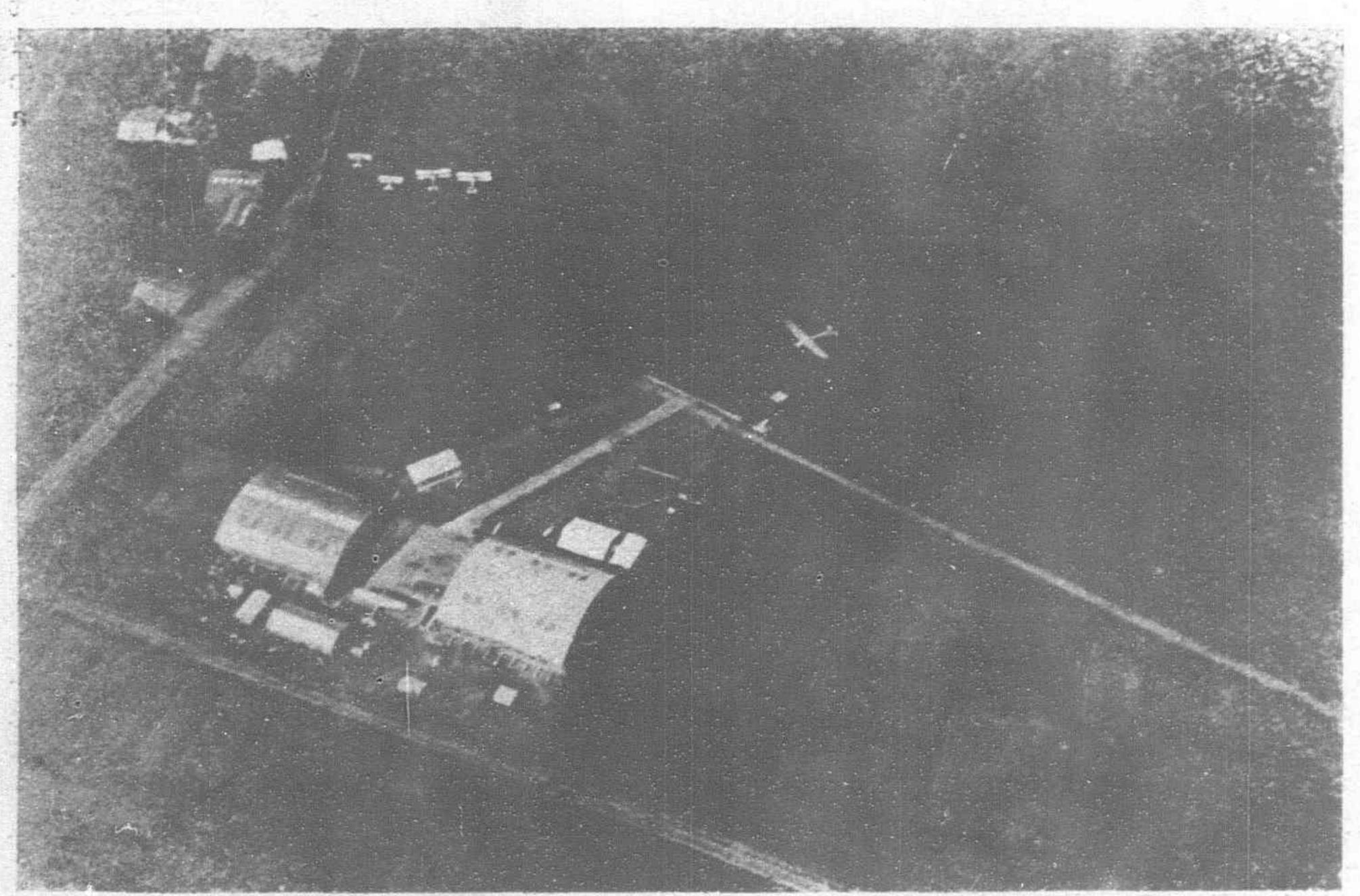
Fukuoka airport, Shiroyama, Najima,

Tatara-mura, Fukuoka suburbs.

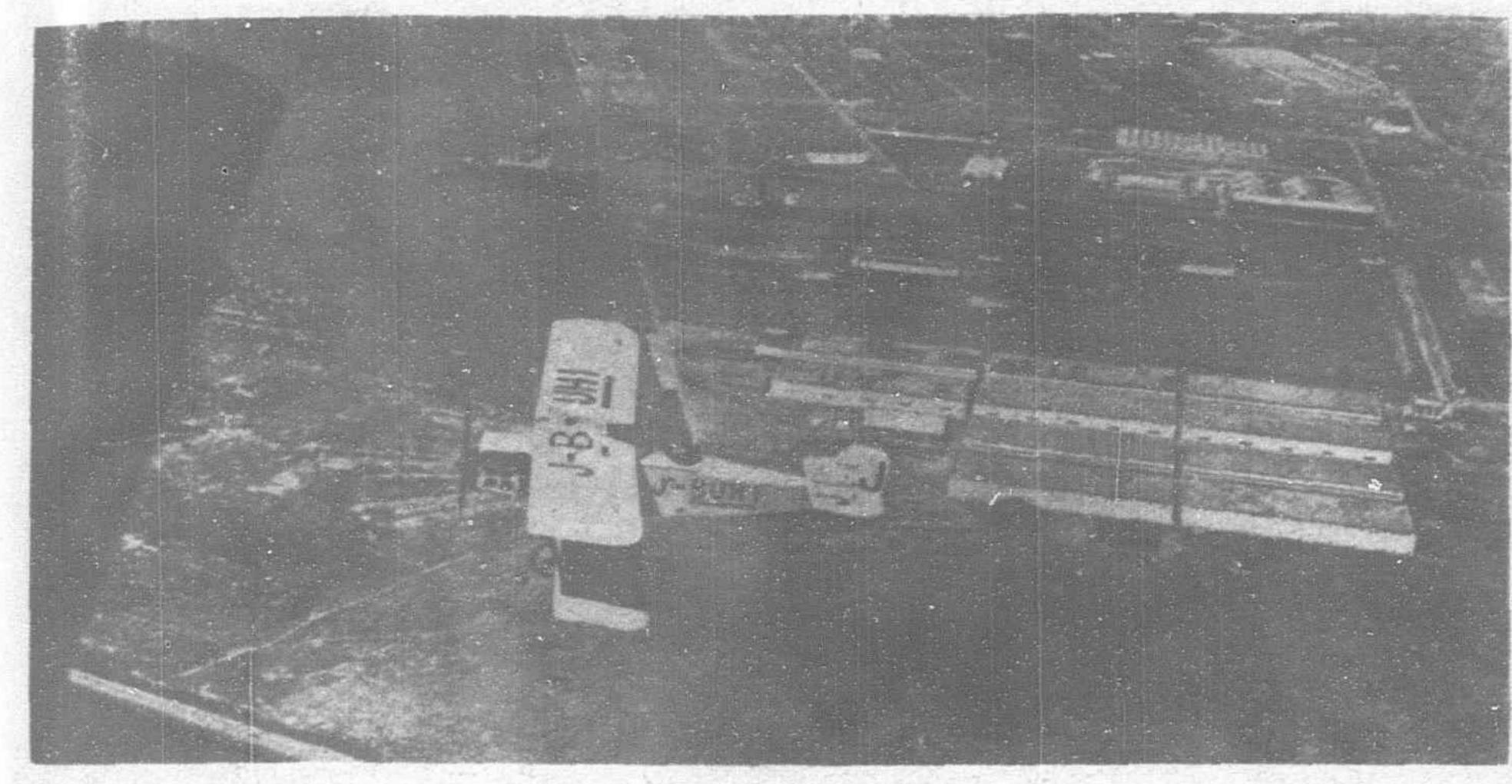
Tokonozawa-machi, near Tokyo. The upper Right Quarter of the Picture is the Tokorogawa Airfield

Osaka bound plane that killed him.

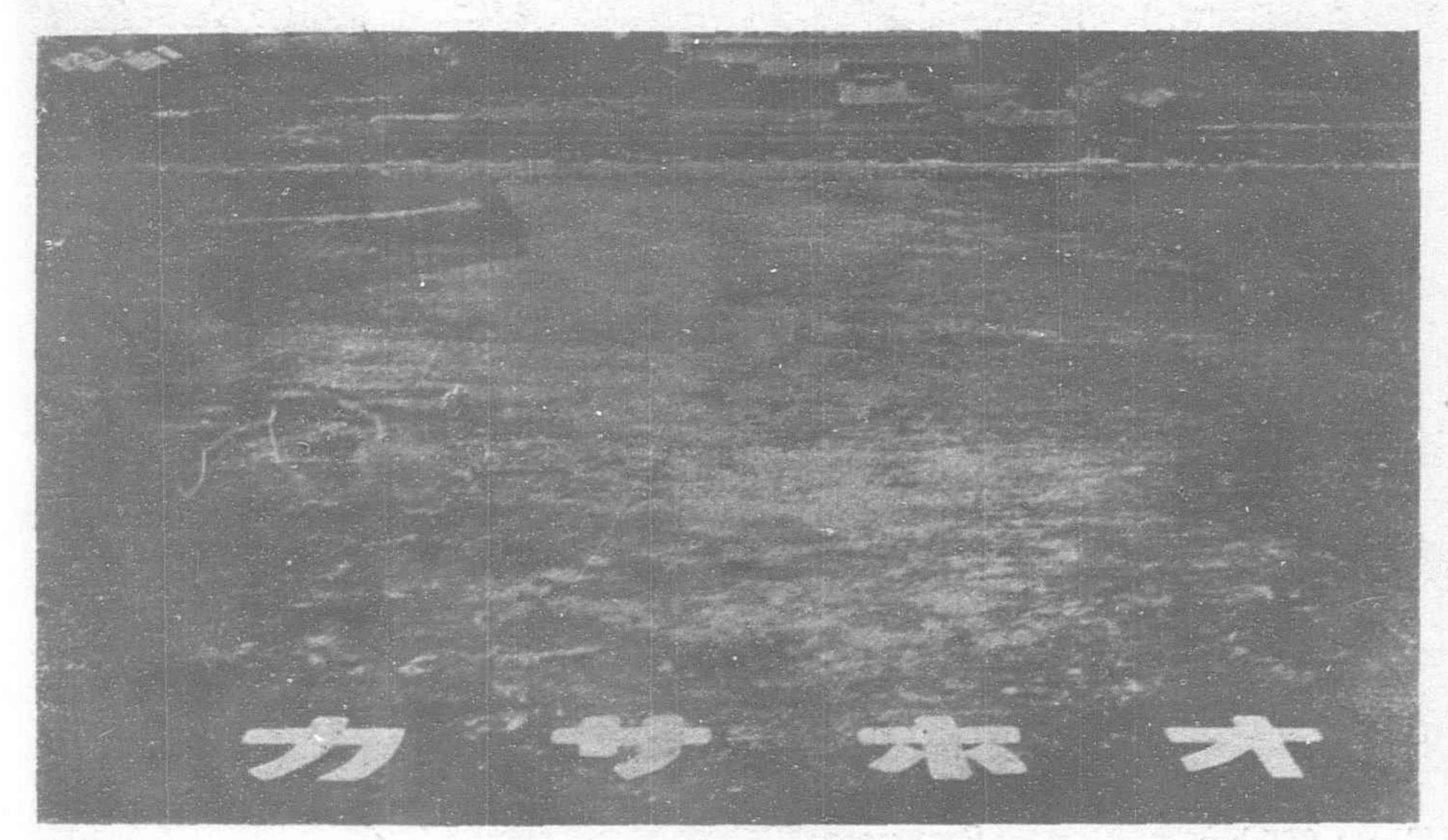
come from Chosen (Korea) that day, and had changed into the



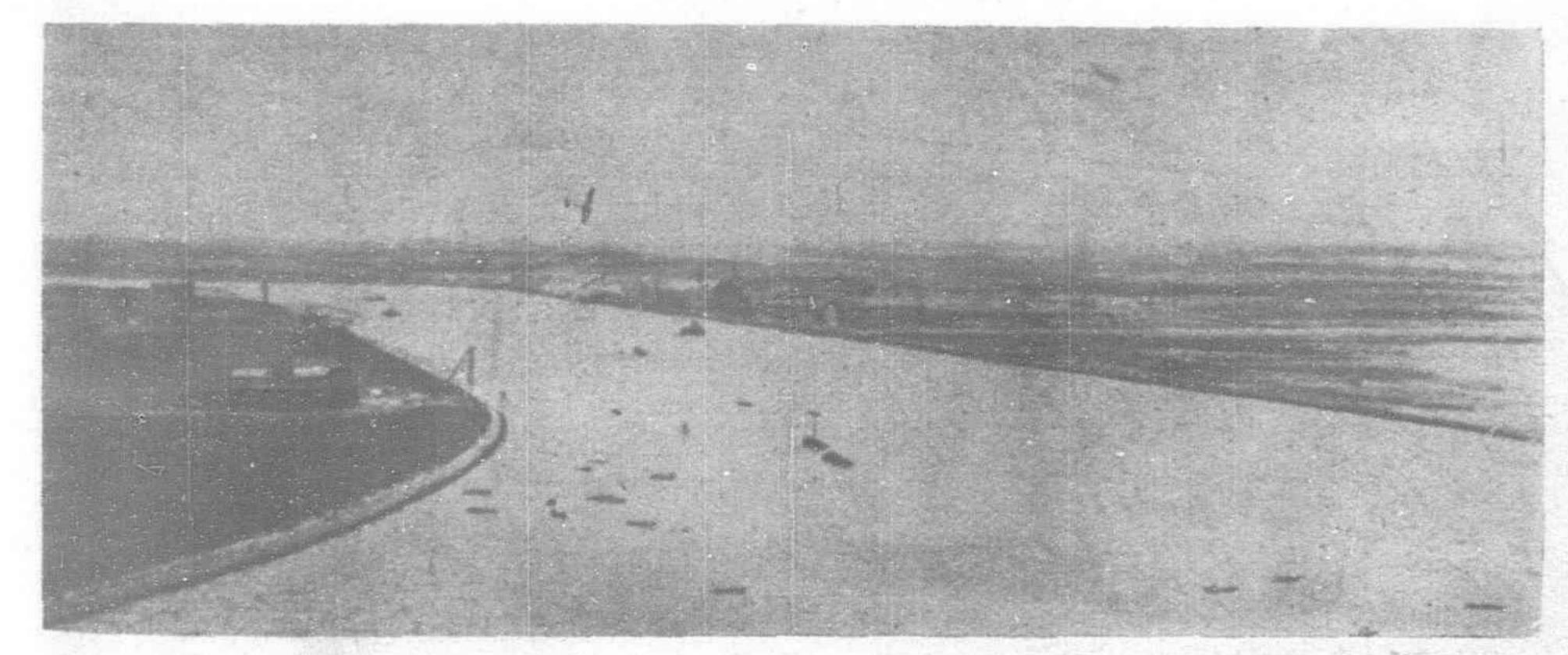
Tachikawa Airport, recently closed to Civilian Flying following opening of the Haneda Airport



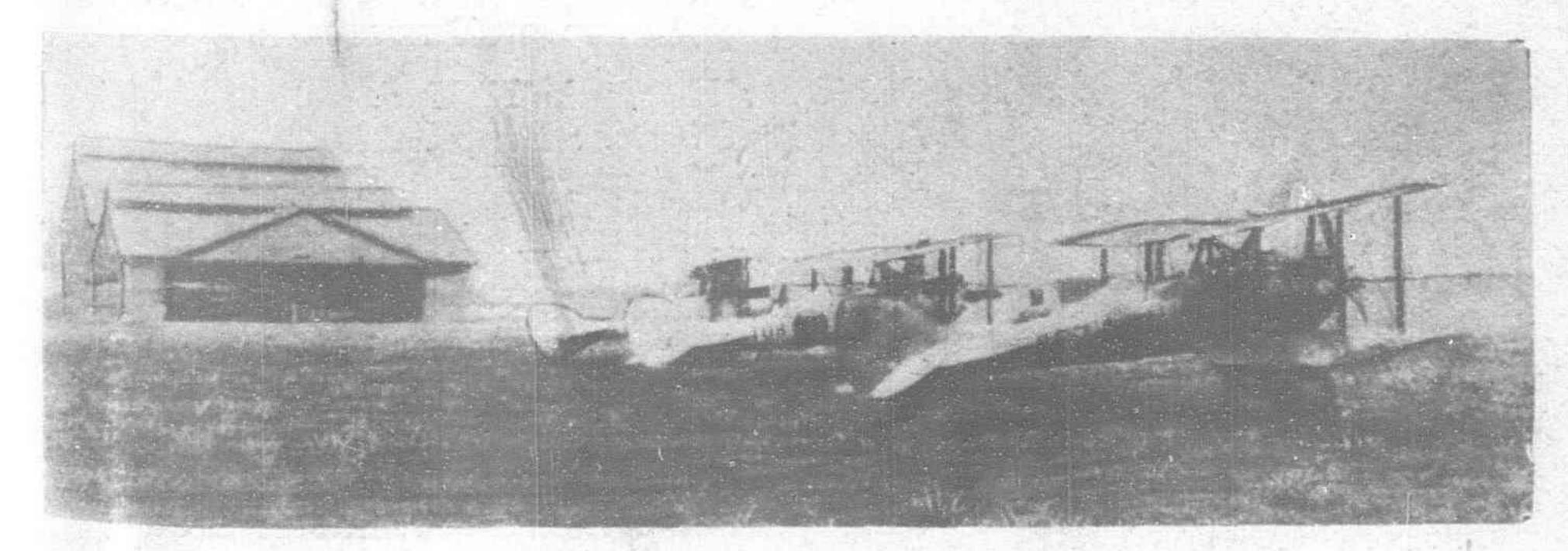
Kizugawa, (Osaka), Airport serving both Land and Seaplanes



Osaka Airport at Kizugawa



General View of Kizugawa River showing Reclaimed Land at Left which is the Osaka Airport



Army Planes at Tokorogawa

Tachiarai airport, Fujikurabori, Tachiarai, Fukuoka suburbs.
Keijo airport, Keijo.
Shusuishi airport, Dairen.
Urusan airport, Urusan.
Heijo airport, Heijo.

BOOKING OFFICES:

Tokyo: The Aviation Hall, Sakurada-Hongocho, Shiba-ku.

Osaka: The Dojima Building, Dojima-Hamadori, Kita-ku.

Fukuoka: The Katakura Building, Kami-Gofuku-machi.

Keijo: The Keijo Building, Hasegawa-machi. Dairen: No. 85, Kiicho, Dairen city.

Business.—Passenger, mail, and freight air transport; all kinds of aerial enterprises as well as duties relating to aerial navigation; investments in aerial enterprises which are approved of by the Department of Communications.

OPERATED AIRWAYS.

Tokyo-Dairen Line:

From		Distance (kilometers)	Flying	Fare (single trip)	Freight (per kilogram)
Tokyo	Osaka	425	2.30	Y.30	Y.1
Osaka	Fukuoka	500	3.10	35	1
Fukuoka	Ursan	240	1.40	18	2
Ursan	Keijo	310	1.50	22	2
Keijo	Heijo	200	1.10	13	2
Heijo	Dairen	400	2.30	27	2
Osaka-Sha	anghai Line	(by hy	dropla	ne).	
Osaka Osaka	Fukuoka Shanghai	500 (Not	3.10 open y	35 et)	1

This company operates its lines every day, except on Sundays, per schedule of two round trips between Tokyo and Osaka, and one round trip between all the other stations, that is, one round trip between Osaka and Dairen and another round trip between Osaka and Fukuoka of the Osaka-Shanghai Line. Consequently, 12 round trips each are made between Tokyo and Osaka, and between Osaka and Fukuoka, and six round trips between Fukuoka and Dairen, per week.

The Japan Air Transport Company has been promoted by virtue of the bill passed by the 55th session of the Imperial Diet in May, 1928, which provided a Government subsidy to the amount of Y.19,970,000 to be granted to the company in the course of 11 years.

Following its establishment in October, 1928, extensive preparations were made to inaugurate its enterprises. In April, 1929, an air mail service was opened between Tokyo and Osaka, and between Osaka and Fukuoka, in July, 1929, with the commencement of passenger and freight services on the same lines. At present, the company operates the entire Tokyo-Dairen Line (touching on its way at Osaka, Fukuoka, Ursan, Keijo, and Heijo) and also, part of the Osaka-Shanghai Line, between Osaka and Fukuoka, the last mentioned line being operated by hydroplanes.

On January 1, 1931, the company possessed 35 airplanes, consisting of (a) 21 land and four seaplanes manufactured by the Atlantic Aircraft Corporation, (b) six land and two seaplanes manufactured by the N. V. Nederlandsche Vliegtuigenfabrick (Fokker), and (c) two Dornier Wal seaplanes manufactured by the Kawasaki

Works of Kobe. Their respective capacities, cost of operation and other details are as follows:

(a) Fokker Super-universal planes made in U.S.A.

Items	Landplane	Seaplane
Numbers Span (meters) Length (,,) Height (,,)	21 15.43 11.16 2.71	Ditto
Accommodation: Flyers	2	,,
Passengers Motors:		
Jupiter, 420 h.p. Fuel consumption per hour	90 (liters)	3.2
Expenditures: (per hour		

Depreciation ... Y.152.692

Cost of upkeep ...

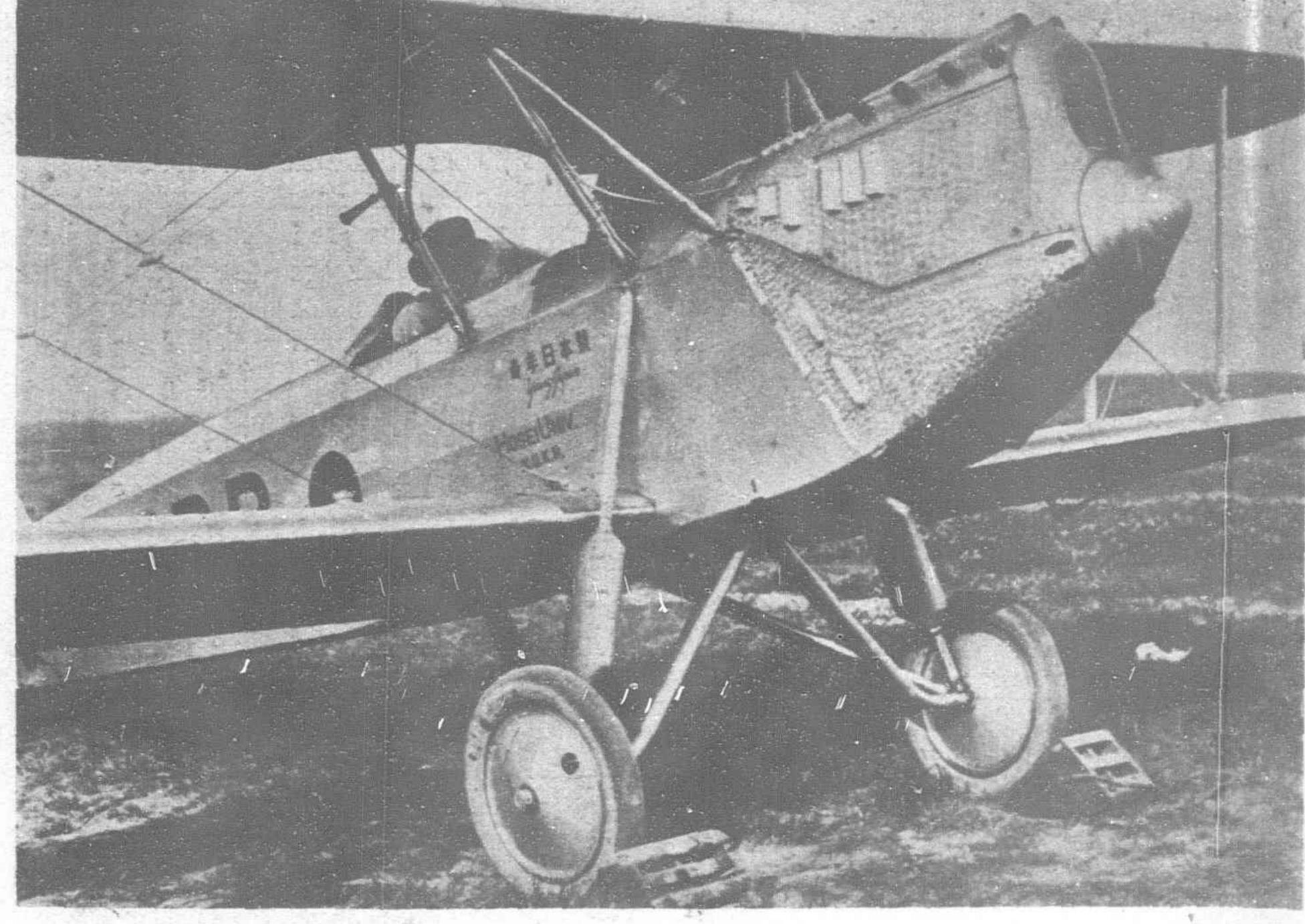
Consumption of

Flight allowances:

Mechanic ...

Aviator

oils



The "Young Japan" which Hosei University Airmen flew to Europe arriving in Paris after many delays

(b) Fokker F. VII b type 3 M planes made in Holland.

11.990

22.025

4.50

1.80

Y.159.359

Ditto

It	ems			Landpla	nes	Seaplanes
Numbers Span Length Height	(meters) (,,) (,,)			21.7 14.6 3.9	0	Ditto
	odation:					
	ers engers	***			2	22
Motors:						
Wrig Fuel con	ght V type sumption	per h	our		0 h.p. 8 (liters)	Three 225 h.p. Ditto
Expendit	tures : (pe	r hour)			
Cost	reciation of upkeer sumption of)			6	Y.58.500



Flight allowa	nces:					
Aviator	***			$4.500 \\ 1.800$		Ditto
						2.2
(c) Dornier-Wal f	lying	boat n	nade	in Japa	n.	
Item	is					
Numbers						2
Span (meters)						22.500
Length (,,)		* * *				17.845
Height (,,)			* * *		* * *	4.640
Accommodation:						
Flyers				***		4
D						6
Motors:						
B.M.W. 500 l	ı.p.		* * *			2
Fuel consumption	per h	our			* * *	280 liters
Expenditures: (p	er hou	ır)				
Depreciation						Y.204.250
after	Cost of	upke				23.450
		nptior	1980	ils	***	87.00

Flight allowances:

Aviator ... Y. 5.10

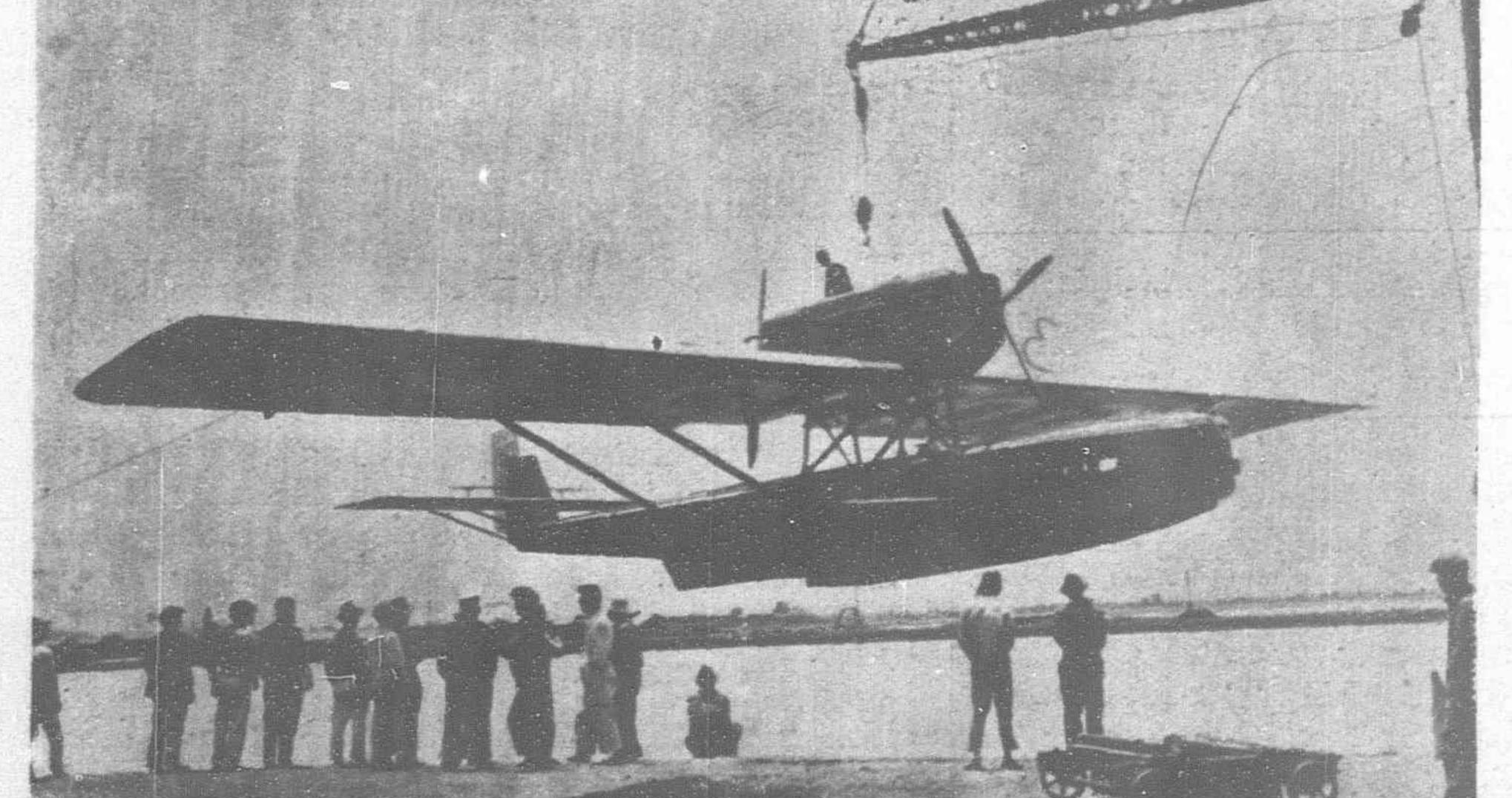
Mechanic ... 2.04

Pilot ... 2.55

Wireless operator ... 2.04

In the list of properties attached to

In the list of properties attached to the balance sheet for the semi-annual business year beginning October 1 and ending March 31, however, it is stated that the company possessed 53 airplanes valued at Y.1,628,454, and 141 motors, valued at Y.1,396,817.



A Dornier Wal Plane built at the Kawasaki Dockyards

BOARD OF DIRECTORS:

President: Keinosuke Nishino. Managing Director: Bunji Saisho.

Directors: Katsutaro Inahata, Shintaro Ohashi, Heisaburo Okawa and Kaichiro Nezu.

Auditors: Keisaburo Hashimoto, Seibei Kawanishi and Bukichi Matsunaga.

Advisers: Baron Yoshiro Sakatani and Lieut.-General Gaishi Nagaoka.

DEPARTMENTAL MANAGERS.

Chief of Technical Section: Gensaburo Obata. Supply Manager: Kenkichi Shoji. Operation Manager: Ko Abe.
Inspection Manager: Saburo
Morikawa.

Enterprise Manager: Shoto-o Saito.

General Affairs Manager: Tatsuji Sashiyama.

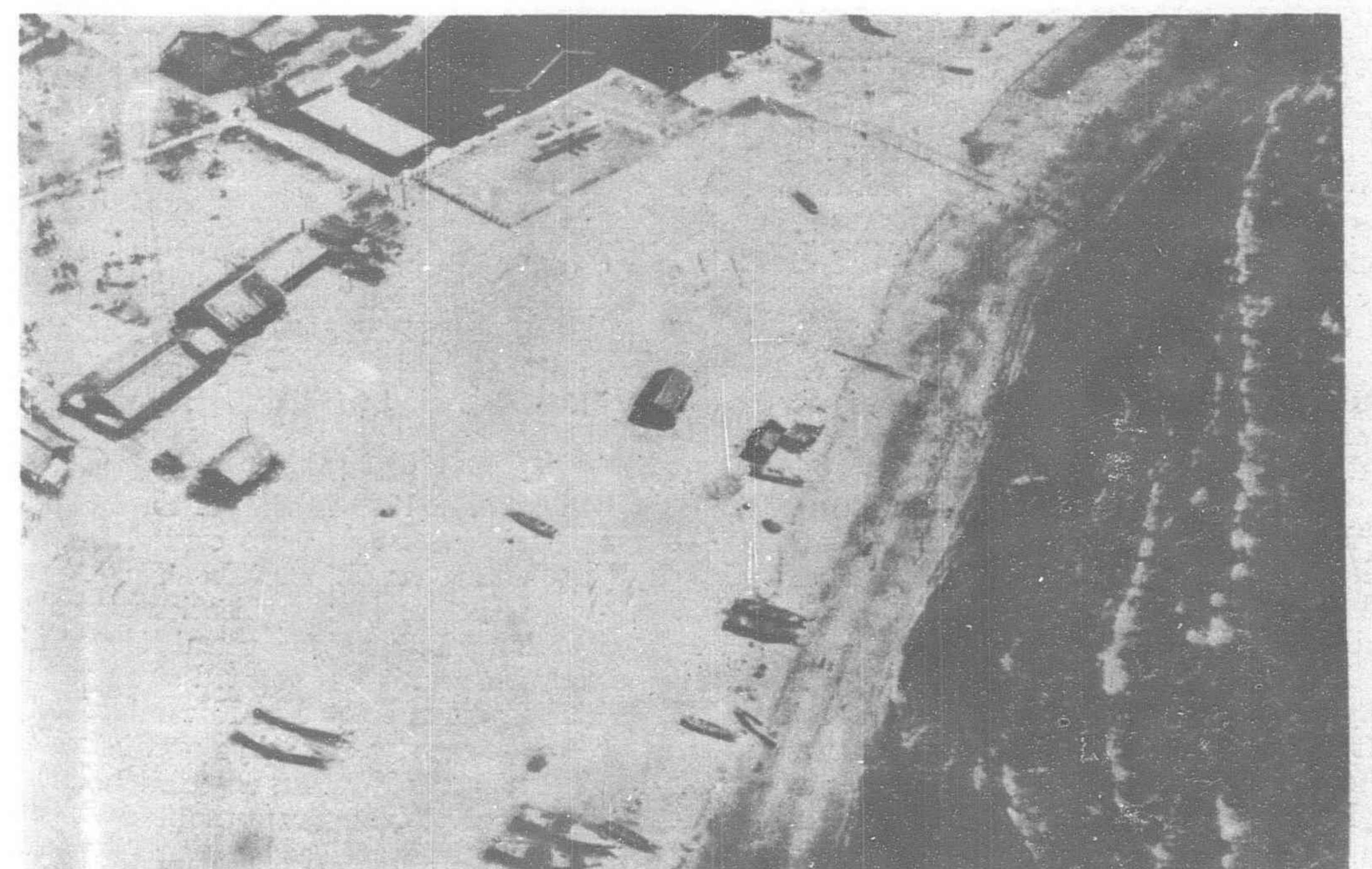
During the semi-annual business year ending March 31, 1931, the company made 883,706 kilometers of flights on schedule. In addition, 36,499 kilometers of extra flights were made, the total amounting to 920,205 kilometers. The operation percentage of the scheduled flights reached 92 per cent, despite the fact that weather conditions were generally unfavorable because of the winter season.

With all its remarkable development in recent months, the enterprise is still far from becoming a financial success, as is the case with many other air transport enterprises abroad. This company's finances dependentirely upon the Government subsidy.

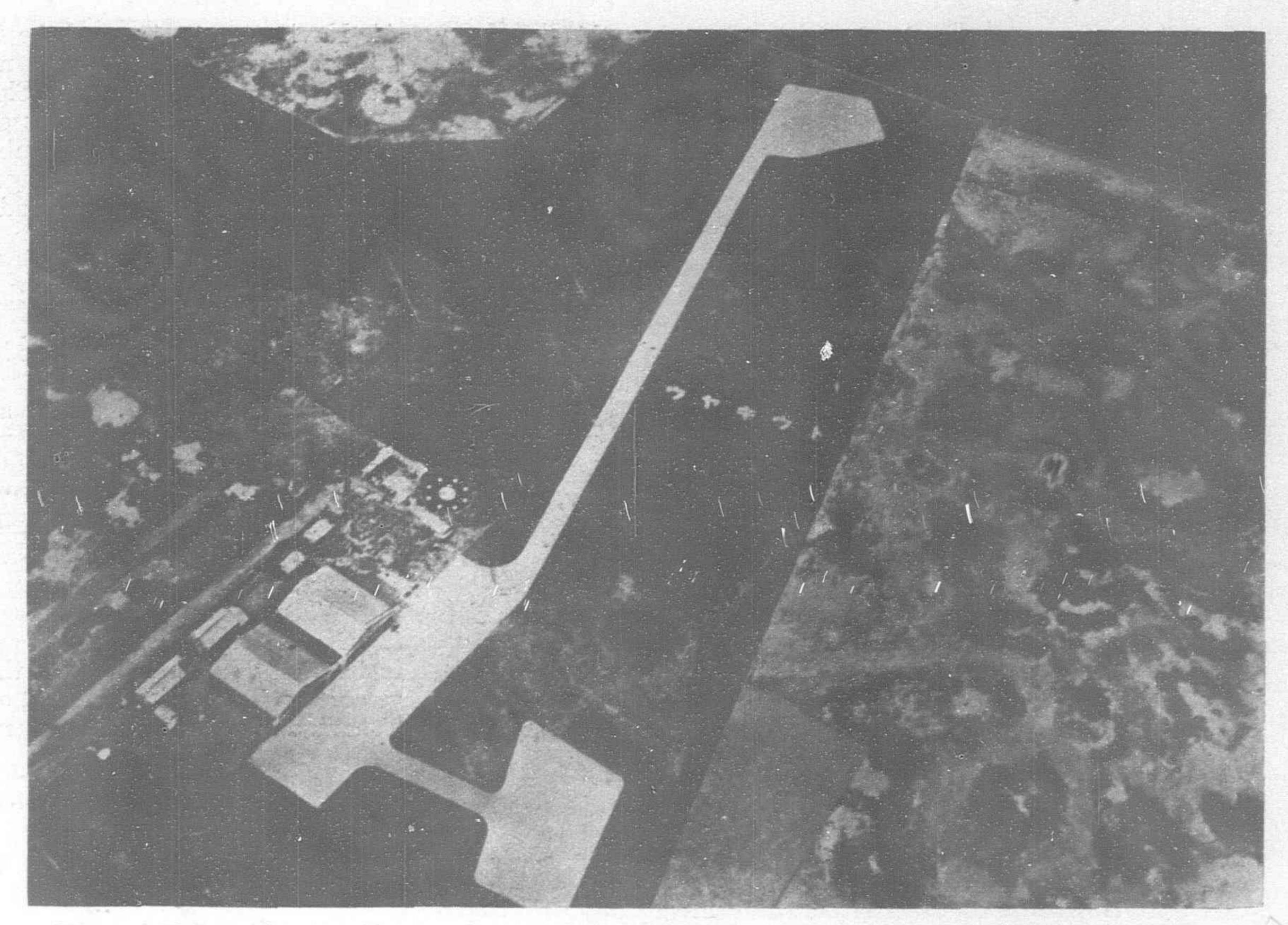
For the semi-annual business term ending in March, 1931, the company reported profits amounting to Y.284,000, which, compared with the preceding six months and also with the corresponding period

of 1929-30, represented decreases of Y.122,000 and Y.104,000, respectively. Furthermore, as the paid up capital increased during the period under review, the profit percentage, too, fell away from 31.5 per cent of the corresponding period of 1929-30 to 14.2 per cent. The company can maintain its 6 per cent dividends still with ease but the financial condition of the company has somewhat deteriorated as seen in the accompanying table: (Unit: Y.1,000).

Items		March, 1931	Sept., 1930	March, 1930
Average paid up capital		3,999	2,750	2,500
Profit		284	406	388
Profit percentage		14.2	31.0	31.5
Dividend percentage	* * *	6.0	6.0	6.0



Sakai-Ohama Airport, near Osaka where Commercial Aviation in Japan was Inaugurated by the Japan Air Transport Institute in November 1922



The new Tokyo Airport which has been opened at Haneda, half way between Tokyo and Yokohama, the first stage of the construction of which cost Yen 2,400,000. Its area is more than 130 acres with a concrete runway of 500 Meters, as shown in the Picture

Items		March, 1931	Sept., 1930	March, 1930
Disposal of profits:				
Profit this term		284	406	388
Profit carried from last t	erm.	852	726	507
Total		1,137	1,133	896
		15	21	20
Legal reserves		I I I I I I I I I I I I I I I I I I I		20
Special reserves	***	70	10	
Emergency reserves	***	30	40	40
Redemption reserves		25	100	
Dismissal allowance res	erves	7	127	35
Dividends	***	120	82	75
Carried forward to next	term	870	852	726

The decrease in the profits despite the considerable advance in the flight mileage has resulted from the increased depreciation on motors and airplanes. In fact, the company managed to reduce various expenditures during the business year of 1930-31 by Y.38,000 as compared with the preceding year, but the depreciation on motors and airplanes showed an increase of Y.599,000 during the same period, as seen in the following table: (Unit=Y.1,000).

(01111-1.1,000).		
Income		1929- Com- 1930 parison
Business income Interest received Miscellaneous income	17	2,866 + 529 $88 - 71$ $22 + 12$
Total	3,447	2,976 +471
Expenditure		
Business expenditure	1,417	1,455 - 38
Depreciation	1,319	720 +599
Drawbacks	1.7	9 + 8
Interest paid	1	3-2
Total	2,756	2,466 +290

789 - 98

Net Profits

As a matter of fact, the business income of this company is made up of the actual income from passenger, freight and mail transportation and also from the Government subsidy. However, the Government subsidy is not granted per schedule, and besides, the management of the company refuses to publish how much it receives from the Government as subsidy. Consequently, figures showing how much the company actually made from its business operations are not available. The company's authorities showed to the Government, however, that its revenue from the passenger fares during 1930-31 registered an increase of 144 per cent, and that the revenues from mail and freight transportation increased by 142 and 274 per cent respectively, during the same period, as compared with the preceding business year. It is estimated, based on this report and various other reference materials, that the company's revenue from business operations during 1930-1931 amounted to somewhere from Y.240,000 to Y.250,000.

According to the original program of this company, it was to report an annual business income of Y.1,289,000 in the 1930-31 business year, as seen in the following table: (In Y.1,000).

	Business Income	Subsidy	Total
1st year (1928-9)	30	380	610
2nd year (1929-30)	611	2,750	3,361
3rd year (1930-31)	1,289	3,580	4,869
4th year (1931-32)	1,639	3,230	4,869
5th year (1932-33)	1,980	2,900	4,880
6th year (1933-34)	2,456	2,010	4,466

The actual earnings of this company are thus much smaller than was planned. A recent survey shows that the volume of mails and freight carried by the airplanes of this company has registered a considerable increase, and that the number of passengers availing themselves of this means of traffic is likely to show further increases this year. Nevertheless, where the strict financial aspect of the enterprise is concerned, the company's outlook is not very bright especially as the Government subsidy is scheduled to be reduced.

The Japan Air Transport Research Studio (Nihon Koku Yuso Kenkyujo)

Established: June 4, 1922.

CAPITAL: Y.500,000.

HEAD OFFICE: Ohama (seashore), Sakai, Osaka Prefecture.

Business Office: Minamidori Itchome, Shinmachi, Nishi-ku, Osaka.

Branch Offices: The Osaka airport, Funamachi, Minato-ku, Osaka. Hamanomachi, Takamatsu (city), Kagawa Prefecture. Umezudera, Takahama, Ehime Prefecture.

Business: Air transportation of passengers and freight.

AIRWAYS: Osaka-Takamatsu-Matsuyama.

From	To			(kilometers)
Osaka	Matsuyama		 	290
Osaka	Takamatsu	***	 	140

This company operates a round trip on its Osaka-Takamatsu-Matsuyama Line every day except on Sundays. During the six months from April, 1, 1930, until September 20, 1930, this company made 700 hours and 42 minutes of flights covering a distance of 94,865 kilometers. In addition, the company made 124 hours and 12 minutes of flights outside of the scheduled flights covering a distance of 13,739 kilometers. The number of passengers carried in the course of these flights totalled 538, and the volume of freight

transported, 2,094 kilograms.

Mr. Choichi Inoue of Tokushima, the founder and proprietor of this institution, enjoys the honor of being the first man to inaugurate a regular periodical commercial flight in Japan. He started his enterprise in a small way, building a hangar, office, motor works, and a dormitory at the southern new park site of Ohama, Sakai city, in June, 1922. In July, of the same year, a flying boat manufactured by the Ito Aircraft Works of Tsudanuma, Chiba Prefecture, equipped with one Hispano Suiza 150 h.p. motor, arrived at Sakai. With this machine, Mr. Inoue inaugurated two periodical flights, one to Takamatsu and the other to Tokushima.

With the inauguration of the Tokyo-Osaka airway in January, 1923, by the Tozai Teiki Kokyukai (The East and West Periodical

Air Navigation Society) of the Osaka Asahi Publishing Company, an arrangement was made by means of which the Tokyo-Osaka airway be connected on to the Shikoku Island by Mr. Inoue's planes.

At the time of the great earthquake disaster in the Tokyo. Yokohama district in September, 1923, this institution showed remarkable activities in passenger, mail, and freight transportation between Tokyo and Osaka, and its activities were rewarded with special encouragement money given to the institution by the Aviation Board of the Department of Communications and also

by the Imperial Aeronautic Society.

An unprecedentedly heavy storm wrought havoe in the Sakai district in March, 1925, and two hangars, six airplanes and materials sufficient to build several airplanes all belonging to this institution were smashed. In May of the same year, however, the institution was restored to some extent with donations from the Aviation Board, the Imperial Aeronautic Society, the Sakai Municipal Assembly, and other sources. It resumed air mail service between Sakai, Takamatsu, and Imaharu on May 20, 1925, by order of the Department of Communications. In May, 1926, the air mail service was further extended to Oita on Kyushu Island.

When the Japan Air Transport Company was established and its Osaka-Fukuoka Line was opened in April, 1929, however, the institution was instructed by the Department of Communications to give up its Sakai-Oita Line, and instead to operate the Osaka-Takamatsu-Matsuyama Line, making one round trip every day except on Sundays. On and after June 1, 1929, this line has been connected with the Japan Air Transport Company's airways.

BOARD OF OFFICERS:

Head of Institution, Choichi Inoue. General Manager, Kiyoshi Honma. Business Manager, Suejiro Matsumura. Chief Accountant, Kunio Kaneno. Airplane Manager, Masaji Nakamae. Motor Manager, Tatsuji Sato.

The Tokyo Air Transport Company (Tokyo Koku Yuso-Sha)

Established: September, 1928.

CAPITAL: Y.200,000.

Headquarters: No. 10, Shinjuku, Kamata-machi, Ebara-gun, Tokyo.

Airports: Suzugamori, Oimachi, Ebara-gun, Tokyo.

Miho, Shimizu (city), Shizuoka Prefecture.

Branch Offices: c/o The Tokai Jidosha K.K., Itomachi, Shizuoka Prefecture.

c/o The Shimoda Jidosha K.K., Shimodamachi, Shibueka Prefecture.

Enterprises: Aerial transportation of passengers, mail and freight; flights for discovery of fish schools; pleasure flights for paying passengers.

AIRWAYS: Suzugamori (Tokyo)—Ito—Shimoda—Numazu—and

Shimizu, a distance of 260 kilometers.

Officials: Yu Aiba, President.

Takemi Kogure, General Manager.

During 1930, this company operated two round trips a week on Tuesdays and Fridays, but since the beginning of 1931, it operates three round trips a week, on Mondays, Wednesdays and Fridays. The company plans to operate six round trips a week excepting on Sundays.

The present air line from Tokyo to Shimoda via Ito across Tokyo Bay was first contemplated in 1923 in view of the fact that communications and traffic facilities between the capital and the Izu peninsula were in a deplorable condition. Test flights were subsequently carried out with success and application was filed with the Department of Communications for permission to inaugurate a commercial air service, and it was granted on August 1, 1929. The bi-weekly flights were then started in November, 1929, with Avro and Hansa hydroplanes between Tokyo and Shimoda. This line was extended to Shimizu via Numazu on April 1, 1930.

The company at present plans to inaugurate the first air taxi service in Japan between principal cities, such as between Tokyo and Kagoshima, Tokyo and Aomori or any other city in Hokkaido, and between Tokyo and Chichijima Island of the Ogasawara Islands,

operating a Japanese built Fokker Super-universal six-seater seaplane. The first of such flights were announced about the middle of August to take place during the last ten days of the month, this year, between Tokyo and Kagoshima, the southern end of Kyushu Island, a distance of 2,310 kilometers (round trip) if the course of Tokyo-Osaka-Najima (Fukuoka)-Kagoshima is taken, and 2,140 kilometers (round trip) if the Tokyo-Osaka-Matsuyama (Shikoku Island)-Kagoshima is chosen. The trip requires about 14 hours' flying and the round trip is to be made within the same day, leaving Tokyo in the morning and returning to the capital from Kagoshima in the evening, although it takes 60 hours and a half by railway.

The Asahi Periodical Air Navigation Society (Asahi Teiki Koku-Kai)

ESTABLISHED: February, 1927.

CAPITAL: Part of the Osaka Asahi Publishing Company, capitalized

at Y.6,000,000 fully paid up.

Head Office: The Osaka Asahi, Nakanoshima, Kita-ku, Osaka. Enterprise: Periodical airmail service during summer.

AIRWAYS: Tokyo-Niigata, 480 kilometers.

This society operates the Tokyo-Niigata Line during three summer months from August to October. During the same period in 1930, the society made 52 flights, 127 hours of flying, covering an aggregate total distance of 19,760 kilometers.

Its enterprise at present is somewhat limited, but the society has a brilliant history, being the first institution to inaugurate the first periodical airmail service between Tokyo and Osaka, and in addition, it has rendered invaluable service toward the progress of aviation in Japan in many ways.

The Ando Airplane Institute (Ando Hikoki Kenkyujo)

Established: January, 1920.

CAPITAL: Y.150,000.

Office: (Aviation field and factory) Hinaga Beach, Asahi-mura, Chita-gun, Aichi Prefecture.

Office: Shin-Maiko, Chita-gun, Aichi Prefecture.

Enterprise: Periodical freight and passenger transportation; training of aviators; casual commercial flights.

Officials: Kozo Ando, President; Shin-ichi Nagasaka, Chief En-

This company operates a weekly freight and passenger service between Shin-Maiko and Gamo, a distance of 62 kilometers, and between Shin-Maiko and Futami, a distance of 120 kilometers.

Aviation Schools

There are 17 aviation schools in Japan, most of which make casual commercial flights, besides flying for training students. They are (in alphabetical order):

The Akita Aviation School (Akita Hiko Gakko): address Shinya-machi, Kawabe-gun, Akita Prefecture; purpose: training

of aviators; principal: Kiyoshi Aizawa.

The Chosen (Korea) Aviation Institute (Chosen Koku Kenkyu-jo): established: March 1, 1929; Capital: Y.30,000, all paid up; head office: No. 140, Kogane-machi 7 chome, Keijo (Seoul); enterprise: aerial freight and passenger transportation, aerial photography, aerial advertisement display, repair of airplanes; President: Captain Saburo Nishio, of the Army, retired; history: Captain Nishio established the institute as a private enterprise in December, 1925, at the present site, and it was later reorganized into a joint stock company.

The First Aviation School (Dai-ichi Koku Gakko): address: Funahashi-machi, Chiba Prefecture; enterprise: training of avia-

tors; Principal: Etsutaro Nunesato.

The Hasegawa Airplane Institute (Hasegawa Hikoki Kenkyujo): address: Oyanagi-machi, Matsumoto, Nagano Prefecture; aviation ground: Sasabe, suburb of Matsumoto city; enterprise: training of aviators and short casual pleasure hops; Principal: S. Hasegawa.

The Japan Aviation School (Nihon Hiko Gakko): established: August, 1916; address: Kamata-Shinjiku, Kamata-machi, Ebaragun, Tokyo Prefecture (school); enterprise: training of aviators

and mechanics, advertisement air displays, pleasure flights, aerial photography, aviation extension course, publication of technical magazines concerning aviation and automobiles, as well as other books and pamphlets concerning aviation; principal: Yu Aiba who is the President of the Tokyo Air Transport Company.

The Japan Central Aviation School (Nihon Chuo Hiko Gakko): address: Mikata-ga-hara, suburbs of Hamamatsu, Shizuoka Prefecture; enterprise: training of aviators: principal: Saburo Naga-

buchi.

The Japan Light Airplane Club (Nihon Kei-Hikoki Kurabu): address: c/o The Ito Airplane Works, Tsudanuma-machi, Chibagun, Chiba Prefecture; established, January, 1930; enterprise: study of aviation and training of aviators for the purpose of making aviation more popular and also to make it a sport. This club is represented by Mr. Otojiro Ito, head of the Ito works, and has, as an adviser, Lieut.-General Gaishi Nagaoka; Colonel Kumao and Baron Sanji Narahara, veteran aviators of Japan, are also advisers to this club.

The Nishida Airplane Institute (Nishida Hikoki Kenkyujo): established: April, 1923; address: the Osaka Air port, Funamachi, Minato-ku, Osaka (research institute); No. 30, Imabashi 3 chome, Higashi-ku, Osaka (office); enterprise: publicity flights, pleasure flights, aerial photography; President: Nakaemon Nishida; General Manager, Isegoro Miyazawa. This institute was established primarily under the name of the Kansai Aviation Association and was engaged in the manufacture and repair of airplanes within the city until it was removed to the present address in 1923, launching into the present enterprise.

The Mazume Aviation Institute (Mazume Hiko Kenkyujo): established: June, 1918; address: Fuji-Susono hikojo (Mt. Fuji aviation field), Harasato-mura, Shunto-gun, Shizuoka Prefecture; No. 1186, Yoyogi, Tokyo; enterprise: training of aviators, publicity flights, aerial photography, etc. The enterprise was primarily opened at Setagaya in the suburbs of Tokyo, but the aviation field was removed to the present site in 1928; President: Mr. Shuntaro

Mazume.

The Empire Aviation School (Mikuni Hiko Gakko): established: April, 1928; address: Tachikawa-machi, Kita-Tama-gun, Tokyo Prefecture; enterprise: training of aviators; President: Torio Ito. The school has been opened following the closing down of the school bearing the same name which was under the management of H.I.H. Prince Yamashina.

The Nagoya Aviation School (Nagoya Hiko Gakko): established: September, 1924; address: Obata-ga-hara, Moriyama-machi, Nagoya, Aichi Prefecture (school); No. 23, Aoimachi, Higashi-ku, Nagoya (city), Aichi Prefecture (office); enterprise: training of aviators and mechanics; President: Lieut.-Colonel-Fukuhei Ohara.

The Negishi Aviation Field (Negishi Hiko-jo): established: January, 1924; office: Miho-no-Matsubata, Shimizu, Shizuoka Prefecture; enterprise: search for fish schools and training of aviators;

representative: Kinzo Negishi.

The Otone Aviation Field (Otone Hikojo): established: October, 1928; address: Sangencho, Imamiya-dori, Choshi-machi, Chiba Prefecture; enterprise: periodical flights between Choshi and Sahara, pleasure flights, fishing flights, and relief work for disasters at sea, training of aviators and mechanics, publicity flights; President: Hidebumi Saruta.

The Suzuki Aviation Institute (Suzuki Hiko Kenkyujo): established: April, 1928; address: Saginuma beach, Tsudanuma, Chiba Prefecture; enterprise: training of aviators, publicity flights and aerial photography; adviser, Mr. Otojiro Ito, Principal: Kikuo Suzuki.

The Eastern Asia Aviation College (Toa Hiko Semmon Gakko): address: Tsudanuma-machi, Chiba Prefecture; enterprise: training of aviators; President: Sukemi Kawabe. This school is also closely related to the Ito Airplane Works of Mr. Otojiro Ito.

The Tokushima Aviation School (Tokushima Koku Gakko): established: November, 1925; address: Kamoa-machi, Nahigashigun, Tokushima Prefecture; enterprise: training of aviators and auto-drivers, publicity flights; President: Yuzo Yokoyama.

The Ube Air Transport Institute (Ube Koku Yuso Kenkyujo): established: November, 1928; address: Kusae beach, Higashi-ku, Ube (city), Yamaguchi Prefecture; enterprise: study of aviation in general, training of aviators and mechanics, and repair of airplanes; adviser: Kenji Maeda; President: Hiroyoshi Hagata.

There are six public airports in Japan, besides intermediary landing fields; they are located at Tachikawa (Tokyo), Kizugawa

(Osaka), Najima (Fukuoka), Urusan (Chosen) and Keijo (Seoul, Chosen). The international airport of Haneda, located half-way between Tokyo and Yokohama is now completed and the Japan Air Transport Company, among other concerns, has started construction of hangars and other buildings. Of these air ports now in service, the Kizugawa airport is both for land and seaplanes, the Najima airport is for seaplanes, the remainder being for land planes.

There are 10 wireless stations which are specially engaged in the aeronautical service, their localities being Tokyo, Hakone, Kameyama (Mie Prefecture), Osaka, Fukuoka, Iwahara (Nagasaki Prefecture) Tomie (Nagasaki Prefecture), Urusan, Keijo, and Dairen. Also there are 17 aviation land marks, all written in white "Katakana" characters. They are located at Numazu and Hamamatsu in Shizuoka Prefecture, Kameyama in Mie Prefecture, Shodoshima Island in Kagawa Prefecture, Imaharu in Ehime Prefecture, Murozumi in Yamaguchi Prefecture, Nakatsu in Oita Prefecture, Yukihashi in Fukuoka Prefecture, eight more in Chosen and one in the Japanese leased territory of Kuantung.

Japan-Taiwan Flight

It was definitely decided about the middle of August that the first Japan to Taiwan (Formosa) test flights be carried out toward the end of September, this year, operating land and hydro planes, by the Japan Air Transport Company as preliminary to the inauguration of a proposed regular air mail and passenger service between the main Island and Taiwan. Aviators chosen to undertake the test flights made various investigations recently, making a special trip to Taiwan. What has so far been decided about this flight follows:

Land Plane: Fokker 7-type tri-motor craft, equipped with three Wright whirlwind engines of 225 h.p. each, to take off Tachiarai at 6 a.m., September 25, and arrive at Taihoku, northern end of Taiwan, at 3.59 p.m., the same day, without landing on its way. The distance is 1,547 kilometers and the flying hours, nine hours and 59 minutes.

Kanji Ogawa, first class aviator and second class pilot, will be in charge of the plane, assisted by Masao Omori, also first class aviator and second class pilot, mechanic Yonetaro Suzuki, and wireless operator Rokuhei Mori.

This Fokker plane itself weighs 3,005 kilograms, and is to carry 1,730 kilograms of fuel, 150 kilograms of lubricating oil, 100 kilograms of wireless apparatus (Marconi AD 6H medium wave length and 7-0 short wave sets), 70 kilograms of mails, four fliers weighing about 280 kilograms in all, and miscellaneous articles weighing 100 kilograms, the aggregate total amounting to 5,435 kilograms. At this full load, the machine will have a flying capacity of 15 hours, the flying distance being 2,325 kilometers, the cruising speed being 155 kilometers an hour.

Included among the miscellaneous goods to be carried are two life-boats for emergency of forced landing on the sea, and food and drinking water to support four men for three days.

The flight schedule of this plane is as follows:

Take off Tachiarai at 6 a.m., fly past Kagoshima at 7.17 a.m., Nagata-Misaki of Yakujima (Island) at 8.09 a.m., Yokoatarijima (Island) at 9.35 a.m., Nawa at 11.38 a.m., Miyakojima (Island) at 1.27 p.m., Taramajima (Island) at 1.51 p.m., Sanhyokaku at 3.39 p.m., and land at Taihoku at 3.59 p.m.

The return trip will be made on October 1, leaving Taihoku at 6.20 a.m., and arriving at Tachiarai at 4.19 p.m., taking the

same course only the other way round.

Hydro Plane: Kawasaki Dornier-Wal flying boat, equipped with two BMW motors of 600 h.p. each is to make one stop at Nakagusu Bay, Okinawa Islands, for refuelling between Najima, Fukuoka Prefecture, and Tansai, northern end of Taiwan, a distance of about 1,800 kilometers, the flying hours being 10 hours and 10 minutes.

Teruo Fujimoto, first class aviator and first class pilot, will be in charge of the flying boat, assisted by Tohei Abe, first class aviator and first class pilot, mechanic, Mitsuo Yoshida and another mechanic Tadashi Takahashi, wireless operator, Bunshiro Murashima.

The machine itself weighs 5,200 kilograms, (including the wireless apparatus), and is to carry 1,720 kilograms of fuel, 96 kilograms of lubricating oil, five fliers, weighing 350 kilograms, 200 kilograms of miscellaneous articles, and 70 kilograms of mails, the aggregate total weight amounting to 7,636 kilograms. At this full

load, the flying capacity of this boat is eight hours, 1,400 kilometers at the cruising speed of 175 kilometers.

Listed in the miscellaneous articles to be carried by this flying boat are about the same things as will be carried by the land plane.

It is scheduled that the boat will take off Najima at 5.35 a.m. September 26, flying past Kurume at 5.47 a.m., Tengu Head of Satsuma Province at 6.44 a.m., Jogahana point of Koerabejima (Island) at 7.35 a.m., and land at Nakagusu Bay at 10.38 a.m. Leave Nakagusu Bay at 11.38 a.m., fly past Hirakubo point of Ishigakigima (Island) at 1.53 p.m., Sanhyokaku at 3.16 p.m., Bitokaku at 3.22 p.m., Fukkikaku at 3.38 p.m., and strike water at Tamsui at 3.45 p.m.

The return trip will be made on September 30, leaving Tamsui at 5.42 a.m., and arriving at Najima at 3.51 p.m., taking the same

course as in the outbound trip.

New Tokyo Air Port Opens

The first stage of construction program having been completed, the new Tokyo airport was opened at Edomisaki beach, Haneda, half-way between Tokyo and Yokohama, on August 25, 1931. The army airfield at Tachikawa (375 acres) of the 5th Air Regiment, part of which has hitherto been used as Tokyo's airport has sub-

The Japan Air Transport Company has removed to the new airport at Haneda where the company has built two 360-tsubo hangars (one tsubo is six feet by six feet). More hangars and office buildings are now being constructed at the south-western corner of this airport by various other organizations, included among them being the Tokyo Air Transport Company, the Tokyo Airport Office, the Aviation Board of the Department of Communications, air post office, the aeronautical meteorological observatory of the Central Meteorological Observatory. The Osaka Mainichi's 200-tsubo hangar, motor assembling plant, and dormitory, among other

buildings, were to be completed in September.

sequently been closed to the civil flying.

Upon completion, it is going to be the best equipped airport in the Orient. One of the conspicuous features of the new air gateway is the 500-meter concrete runway which divides the entire field in two from south to north. Near the half-way between the two ends are embossed in relief five "katakana" characters, signifying Tokyo. Near where the concrete runway adjoins the Japan Air Transport Company's hangars, it widens considerably. On this widened section abuts a crosswise runway which is capped by another concrete 700-tsubo square so that the runway at this end is shaped like a letter H. The airport will also be equipped with such indispensable workshops as readjusting plant, airplane repair works, and airplane weight meter, and the like.

At present, lawn covered space extends only to 50 acres, financial retrenchment making its influence felt here again. But the first stage of construction work, even with such retrenchment, en-

tailed the expenditure of Y.2,400,000.

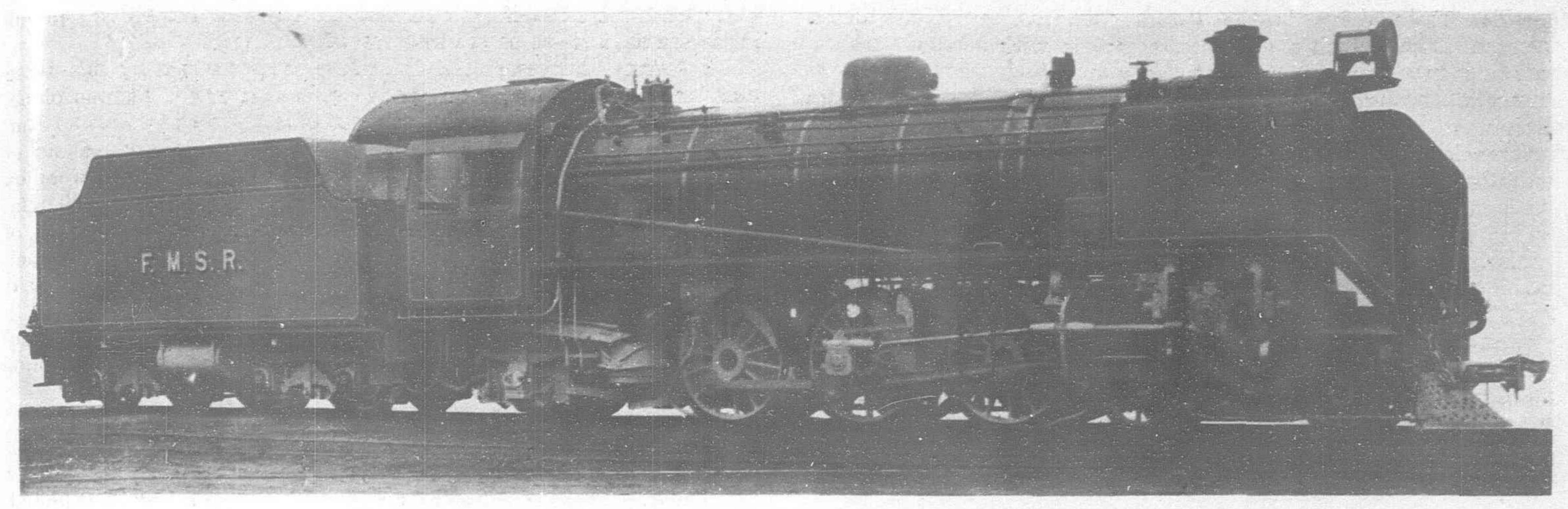
This airport is now linked with Tokyo proper by a paved highway over which the motor journey to the business section of the capital can be made in 25 minutes. It took almost twice as much time from Tachikawa to Tokyo.

Engineering and Railway Exhibition

Under the auspices of the Ministry of Railways of the Nanking Government, an International Engineering and Railway Exhibition is to be held by Chiao-tung University on the grounds of the University at Ziccawei, December 12 to 27. The announced purpose of the exhibition is to bring before the Chinese public, and particularly before those engaged in engineering activities and education, the latest developments in engineering, industrial and scientific products, in railway appliances and equipment and in methods of administration.

Space for exhibits, which is being provided without charge, is being allotted and in connection with these exhibits it is announced that gas, electricity and water will be supplied on the University account.

A committee of the Faculty of the University is caring for exhibits of manufacturers and industries not represented in Shanghai. General arrangements for the exhibition are under the direction of Mr. Sheng Z. Wang, who is chairman of the Executive Committee of the University.



Three Cylinder 4-6-2 Beyer, Peacock Locomotive for the F.M.S. Railways

Beyer, Peacock Locomotives for Malaya

N interesting order for five 3-cylinder 4-6-2 type locomotives has recently been completed by Messrs. Beyer, Peacock & Co., Ltd., of Manchester for the Federated Malay States Railways. These locomotives, which are designated as Class "S" are probably the most powerful orthodox type passenger locomotives in the World operating on the meter gauge, developing a tractive effort of 29,470 lb. at 85 per cent boiler pressure. The following leading dimensions are of interest:—

		I	ENGINE			
Cylinders (two out	side,	one ins	ide)			17-in. by 24-in.
Boiler Pressure						180 lb./sq. in.
Coupled Wheels						4-ft. 6-in.
Wheelbase (rigid)						10-ft.
,, (total			***			28-ft. 3-in.
Heating Surface:						
Tubes Firebox (inclu	 ding	arch tu	bes)			1,822 sq. ft. 160 sq. ft.
Total eva Superheater	porat	ive	***			1,982 sq. ft. 353 sq. ft.
Total	* * *		* * *			2,335 sq. ft.
Grate area		* * *				35 sq. ft.
Maximum axle loa						16 tons
Total weight of en	gine ii	n work	ing ord	er	* * *	70 tons 3 cwt.
		Т	ENDER			
Coal capacity Water capacity						7 tons 4,000 galls.
Total weight of ter	nder, i	n work	ing ore	ler		45 tons 3 cwt.
Total weight of en	gine a	nd ten	der, in	working	3	

Considerable attention has been directed to the minimizing of smoke in the cab, smoke deflector plates having been fitted at the front end in order to carry the exhaust clear of the cab windows. In addition, special smoke cowls have been fitted at the cab windows. A spacious cab has been provided, the various fittings and controls being arranged to the best advantage.

order 115 tons 8 cwt.

The boiler, which has an outside diameter of 5-ft. 4-3/16-in. is fitted with 28 steel tubes of 5\frac{1}{4}-in. diameter outside, and 151 steel tubes of 2-in. diameter outside. The firebox, which is of steel, is provided with water-space stays of "Longstrand" steel, and fitted with arch tubes.

The coupled wheels, which are of 4-ft. 6-in. diameter, have a wheelbase of 10-ft 0-in., the driving wheels being provided with thin flanges.

The leading four-wheeled bogie is of the sliding type, with spherical side-bearers, the total side play being 4-in. The trailing two-wheeled bogie is of the swing link type, provided with outside bearings and with a total side play of 5-in. Water is fed to the boiler by means of two Davies and Metcalfe No. 11 hot water injectors of the non-lifting type, delivering through top-feed clackboxes.

The Superheater Company's superheater with multiple valve regulator in the header is fitted in the smoke box, the outside diameter of the elements being 13-in. A shutdown valve is incorporated in the dome to allow steam to be shut off from the superheater if required. A spark arrestor is also incorporated in the smoke box.

Lubrication.—The cylinders and coupled axleboxes are lubricated by means of Wakefield's mechanical lubricators, auxiliary syphon lubrication being provided for use on the coupled axleboxes if required. Ordinary syphon lubrication is also provided for the coupled axlebox slides, pony truck axleboxes and the two leading axleboxes of the four-wheeled bogie.

Brake Gear.—Provision is made for automatic vacuum braking to the coupled wheels of the engine, and combined automatic vacuum and hand-brake for the tender. The latter is of the double four-wheel bogie type fitted with "Skefko" roller-bearing axleboxes arranged for grease lubrication.

Lambert's sanding is provided to the front of the leading and

to the rear of the trailing coupled wheels.

"R.C." POPPET VALVE GEAR.—The steam distribution in the 3 cylinders is by means of the "R.C." Popper valve gear, which is applied in the following manner:—

The two outside cylinders are each fitted with four Poppet valves, two at each end. The valves are placed side by side, one at each end being for admission and one at each end being for exhaust.

For the center cylinder the valve arrangement is somewhat different for, owing to the inclination necessary in order for the connecting rod to clear the leading coupled axle and also to its height relative to those outside, the steam and exhaust valves are arranged on each side but in the same horizontal plane as the valves for the outside cylinders.

In common with all "R.C." equipment the valves work in the horizontal plane and are operated by cam shafts enclosed in cam boxes.

For the engines under notice there are two cam boxes, one at each side. They are bolted to the top of the outside cylinders and each is fitted with a cam shaft equipped with cams for operating the steam and exhaust valves for each of the outside cylinders. Whilst the cam box on the right hand is also fitted with a set of cams for operating the exhaust valves for the center cylinder, on the left hand side the cam arrangement is exactly the same with the exception that a set of cams is provided for operating the steam inlet valves for the center cylinder.

The main drive is the standard "R.C." arrangement in which a gear box complete with gears is mounted on a return crank, which connects through fully universal main drive shafting to the worm and wheel drive in the cam boxes at each side of the locomotive. It will be understood that the main drive is in duplicate, one complete set being used on each side.

Reversal and control of cut off is obtained by sliding the cam shafts in a direction transverse

to the center line of the engine.

The cam shafts are controlled by means of a rack and pinion gear enclosed in a housing fitted to the upper part of each cam box.

Connection between the reversing rack and the cam shaft is effected by a stirrup piece with a forked end engaging the cam shafts between thrust washers.

The rack pinions are connected together through enclosed bevel gears and a transverse shaft.

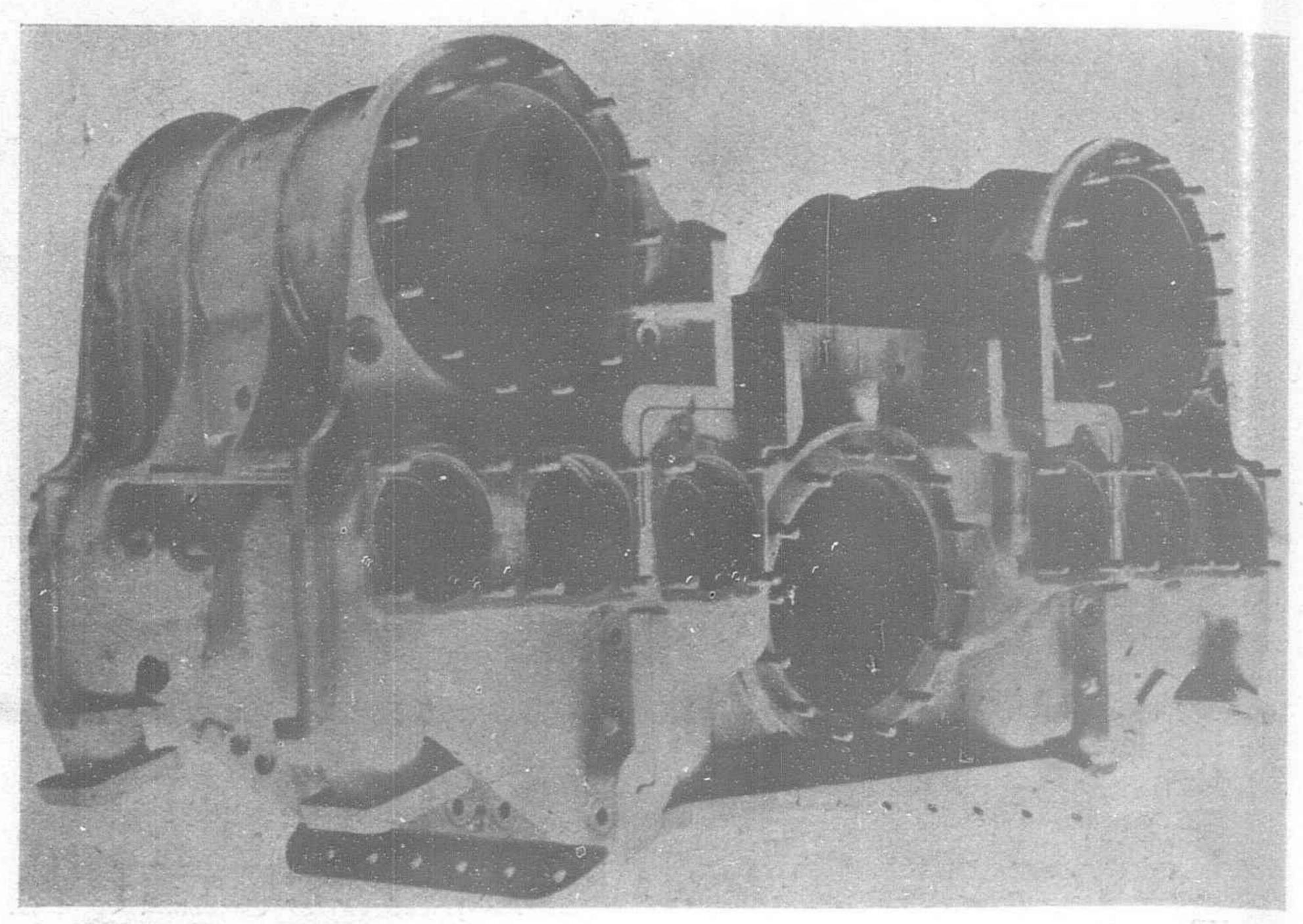
The driver's control consists of the usual rotating handle with trigger and catch plate. This is connected on the right hand side of the engine to a reduction gear box, by means of a tubular shaft, and from the reduction gear box a short shaft extends forward to one of the before mentioned bevel gear boxes.

The whole arrangement is neat and compact and the whole of the main driving gears and all those connected with the reverse

are entirely enclosed and self lubricating.

Grease lubrication is applied to the worm gear bearings in the return crank gear boxes, the intermediate bearings for the main drive in the outside motion plates, the universal couplings in the main drive shaftings and also those in the reverse shaft connection.

Other special fittings include Ross "pop" safety valves, Stone's electric head, cab and tail lights, "Diamond" soot blowers, "Teloc"



Cylinders for Beyer, Peacock 3-Cylinder Locomotives, Patents Pending

speed indicators, A.B.C. couplers and drawgear, and Goodall's articulated drawbar, between engine and tender.

The provision of blue planished steel clothing plates and rustless steel clothing belts adds a pleasing appearance to these locomotives. Asbestos mattresses have been supplied for the firebox only.

These locomotives have been built to the requirements of Mr. A. W. S. Graeme, Locomotive Superintendent of the Federated Malay States Railways, and under the supervision and inspection of the Crown Agents for the Colonies.

Recording Sound for Motion Pictures in Asiatic Jungles

(Continued from page 550).

equipment to a lesser extent. All sound apparatus was placed in drying chambers at night. Although these chambers were constructed to be normally heated with electric light globes, the lack of suitable power supply in many places made the use of Coleman lanterns for heat supply necessary.

After completion of the Quantan sequences of the picture, the production unit returned to Singapore, where the laboratory equipment was dismantled and set up in a small steamer which was chartered for a leisurely voyage to Soerabaja, Java. The company spent the next month on this portion of the journey, stopping to photograph particularly scenic spots, travelling in one instance nearly fifty miles inland to obtain views of one of the beautiful mountains. The scenes photographed on this part of the trip will do much to enhance the beauty of the finished picture.

After arrival at Soerabaja, the production and laboratory units separated again, the production unit going into the jungle about three hours by motor-car, while the laboratory technicians set up their equipment in a building rented in Soerabaja. It was a comparatively simple matter to transport the exposed film into the laboratory from this relatively nearby shooting location by motor-car.

It is the usual practice at the studio for the director and technical staff, including cameramen, sound crew and the principal actors and actresses to view the previous day's "take" in the projection room after completion of the day's shooting. Each night the exposed film is put through the laboratory processes and made available to the personnel of the particular company on the following evening. Thus any mistakes or spoiled scenes are discovered and may be retaken before any serious harm results (that is, before the

set is taken down or particular players become unavailable or costumes are remodelled). However, on the first portion of the expedition, it was obviously impossible forany one to view the "rushes" (as each day's scenes are known in studio vernacular) until the return to Singapore, when the entire six weeks work was reviewed. However, with arrival in Soerabaja, the director and various members of the staff managed to get in each evening in order to look at the previous day's work. A local theater was utilized, the rushes being run off in the theater after the regular evening performance had been completed.

Various sequences were photographed in the country adjacent to Soerabaja, the company spending about a month in that portion of Borneo. A point of engineering interest is that considerable difficulty was experienced in replacing items of electrical equipment on account of the great difference between standards of electrical units in Asiatic countries and those in common use throughout the States.

The final scenes of the picture were shot near Soerabaja, and the company left almost immediately for California. Travelling by way of Japan, they sailed for Vancouver where they were met by Mr. Jack Lawton, Location Manager for Universal Pictures Corp., representing the company. The equipment was checked in there, and it was found that not one item of either camera or sound equipment had been lost during the trip.

The picture, which is to be released under the title "East of Borneo" is now in the process of final cutting and editing at the studio, and will very shortly be ready for theater distribution.

Bangkok Talking

The New Siam Transmitter Phya Thai

taking place, since the beginning of this year, from the studio of Radio-Bangkok via the new transmitter Phya Thai (fig. 1), and according to reception reports these broadcasts have given excellent results.

Before the Siamese Government decided to build a permanent broadcasting station, the Government Radio Service carried out an investigation, with the aid of an experimental transmitter of about 1 kw. as to what wave length would be the most suitable for definite broadcasting service in that country.

Broadcasting was carried on temporarily by means of the above-mentioned experimental transmitter, on a wave-length of 440 meters.

When travelling through Europe in 1929 H.R.H. Prince Purachatra, Minister of Commerce and Communications, paid a visit to the Philips factories at Eindhoven, where he inspected, among other things, various broad-

casting transmitters.

After tenders had been submitted for a permanent broadcasting installation for long and short waves, the order for building this transmitter was placed with Philips' Radio.

In 1930 the above-mentioned broadcasting installation was delivered at Bangkok, erected at a distance of about eight kilometers from the city and put into service.

In designing this transmitting installation it was necessary to comply with special requirements regarding the distance over which the station

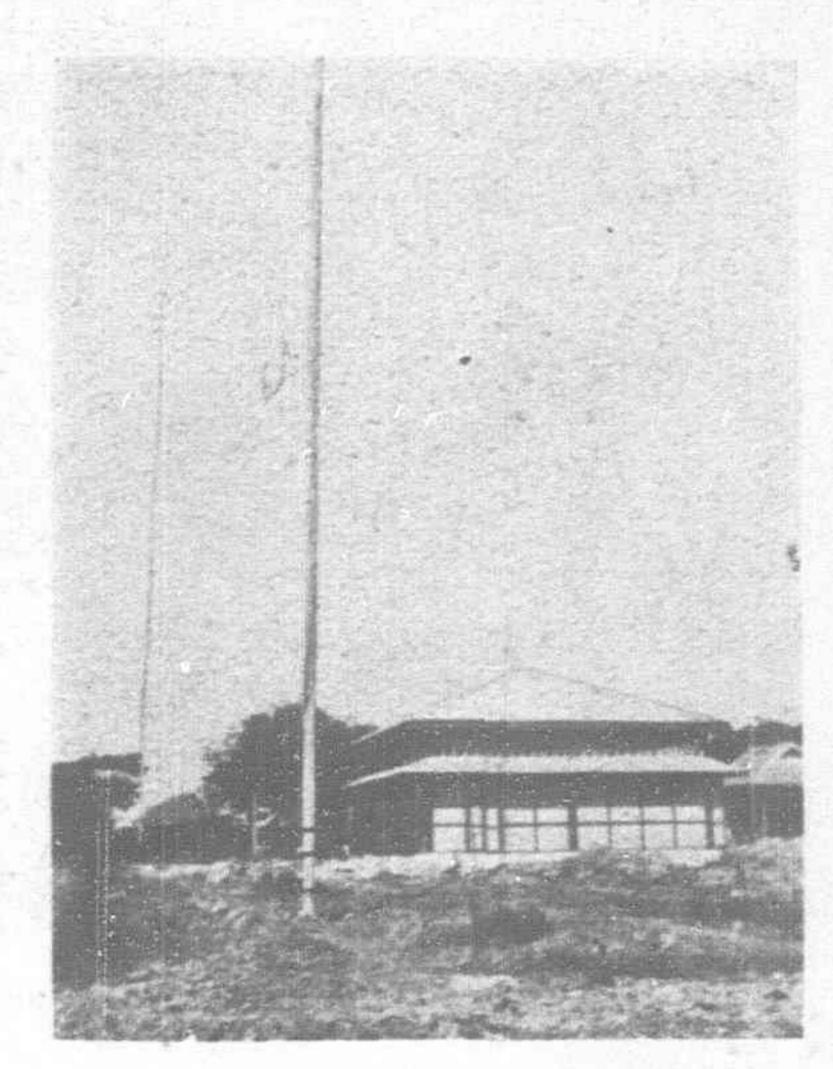


Fig. 1.—Phya Thai Transmitting Station

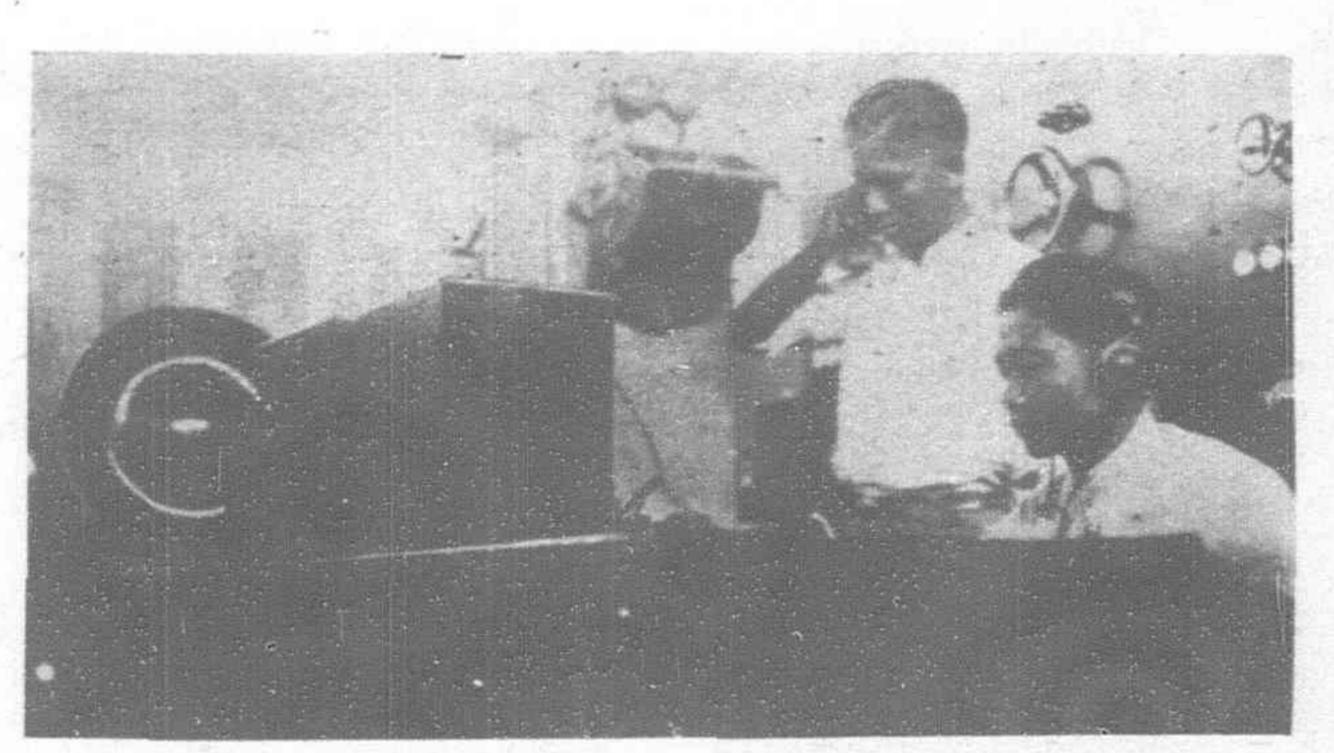


Fig. 2.—Operating Desk

was to be audible. It is known that the range of short waves, at a given aerial power, is greater than that of long waves, and for this reason a station was constructed for Phya Thai consisting of a long-wave and short-wave transmitter, modulated by one and the same modulation system with a change-over device.

The long-wave transmitter is suitable for a definitely adjusted wave-length of about 355 meters; the short-wave transmitter is continuously variable for a waveband ranging from 25 to 40 meters.

The aerial, which is erected on poles 40 meters high, radiates a power of 2.5 kw.

The building in which the transmitters are installed is of teak wood covered with asbestos cement and is painted in fresh colors. The floors and foundations are of reinforced concrete.

Careful attention has also been paid to ventilation and lighting, and the whole building

has been made mosquito-proof. At the front is a square with a pond in the middle, in a bed of concrete. This pond furnishes the cooling-water for the water-cooled valves. Behind the building are the aerial leads. Here, too, are the aerial poles; these moored masts of Mannesmann tubing are 40 meters high and bear the two aerials for the long and short wave. For the long wave an L aerial is used and for the short wave a single-wire aerial.

Upon entering the transmitter house one finds on the righthand side a door giving access to the engine-

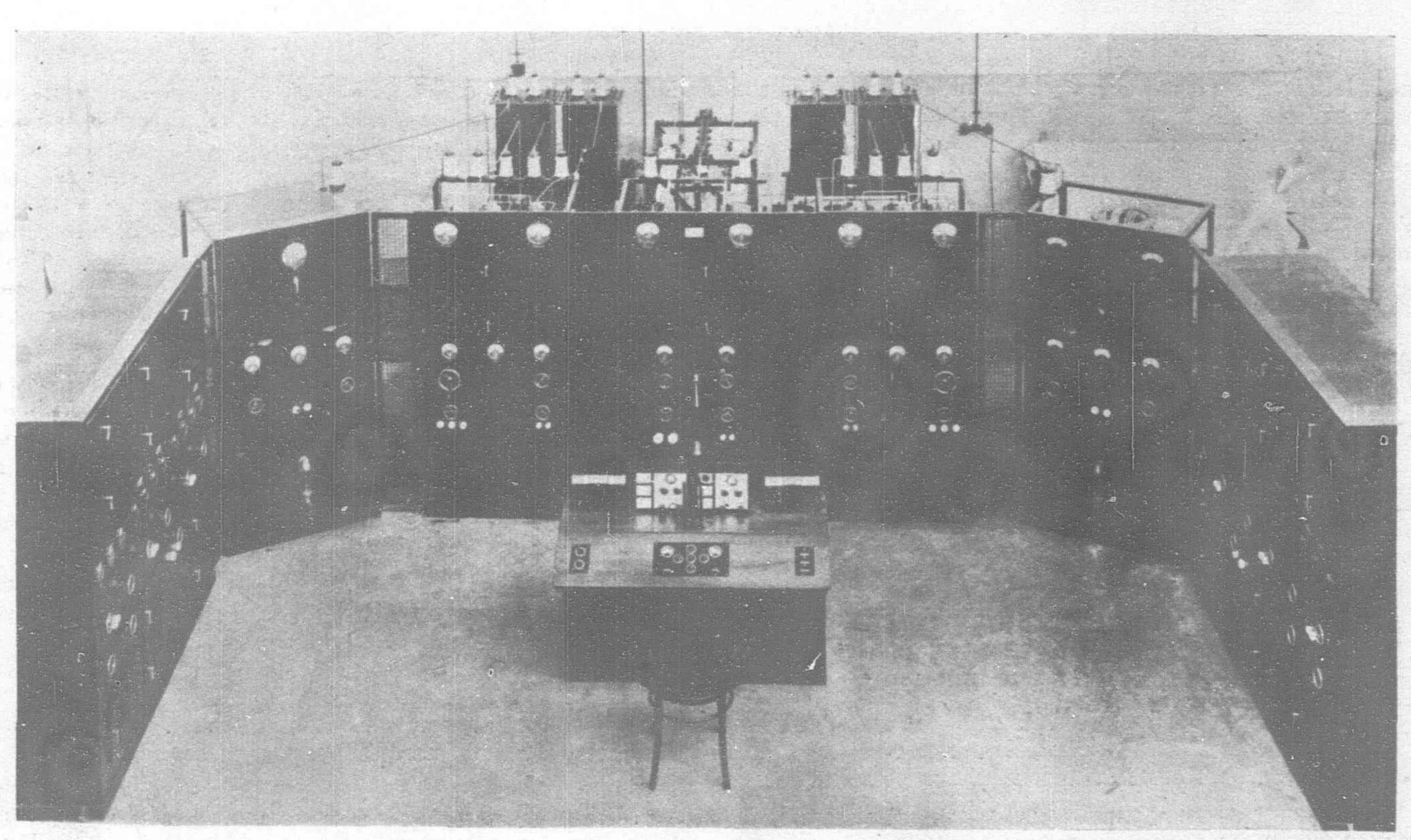


Fig. 3.—General View of Transmitting Installation

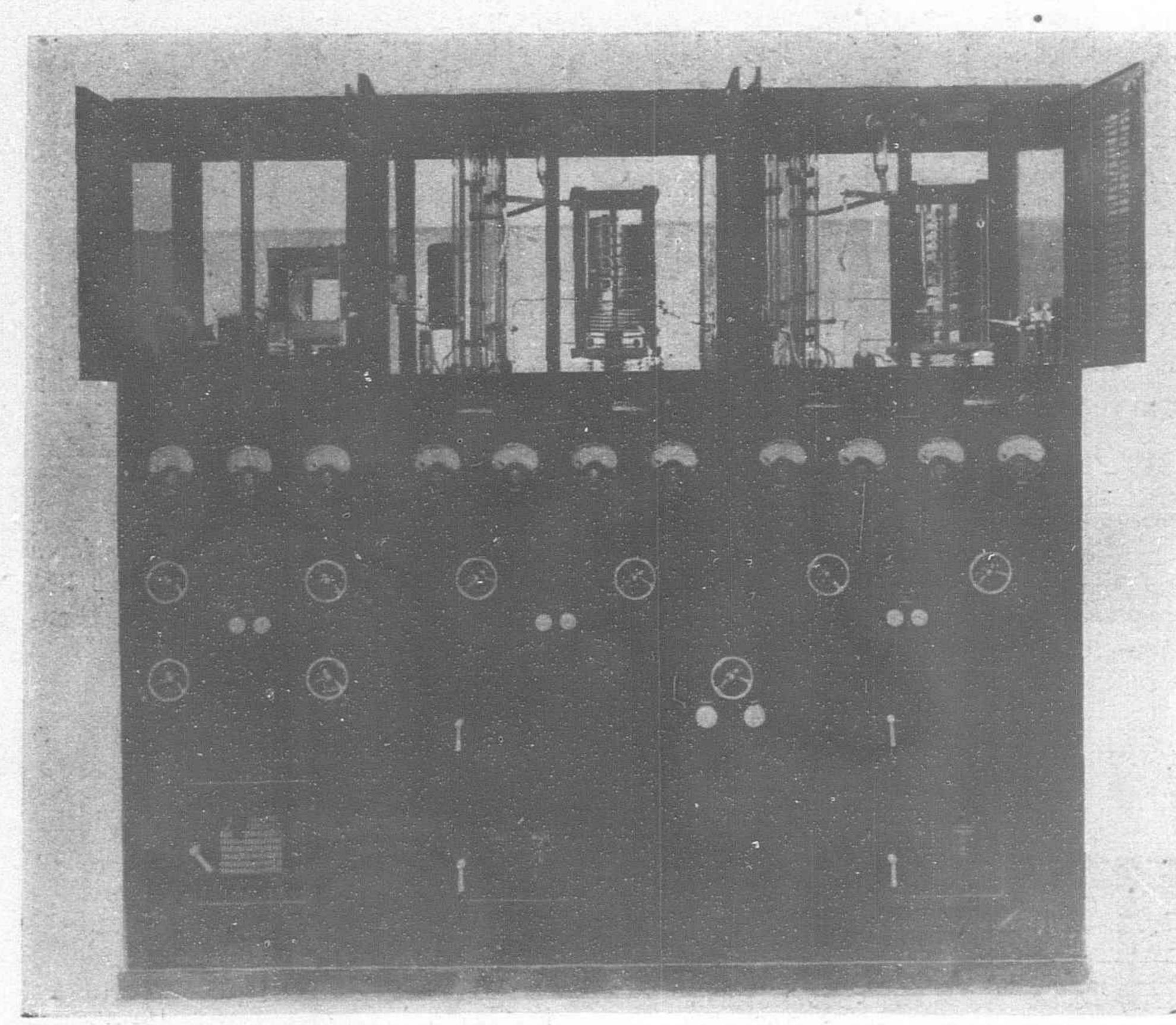


Fig. 4.—Short Wave Part of Transmitter: Doors Open

room, where two cooling water pumps are installed for the modulating and transmitting valves, two high-tension generators for the long-wave and short-wave control circuit and two filament current generators for the various filaments.

Behind the engine-room is a high-tension cell. This is where the 4,500 volt tension supply from the government power station enters the building and is stepped down to 220 volts for feeding the switchboard of the engines and rectifiers.

Directly opposite the outer door is the door giving access to the transmitter room. In the middle of this room is the operating desk at which the operator (fig. 2) controls the modulation depth and corrects, if necessary, music and speech coming from the telephonic cable. Directly in front of the operator are the two final stages of modulation, the last of which has an anode power of 12 kw. On his left is the short-wave transmitter, on his right the long-wave transmitter. The operator is thus able to take in at a glance all the meters in the transmitters.

Behind him is the switchboard of the engines and rectifiers and the drive of the oil-break switch in the high-tension cell.

A general view of the transmitting installation, which was photographed in the factory before despatch, is given in the accompanying (fig. 3). On the extreme left is the short-wave transmitter (continuous waveband 25-40 meters), consisting of four stages, viz, control circuit, separator and two amplifiers; a number of measuring instruments for checking purposes are built into the front panel, and several operating handles are also visible. In the next panel, the second from the right, is the final amplifying stage with a Philips water-cooled transmitting valve, type TA 12-10,000 k. Besides the operating handles, we find here the necessary checking meters and at the bottom a water-gauge which indicates whether sufficient water is available for cooling the transmitter. Fig. 4 shows the short-wave part of the transmitter, the doors of which have been opened.

Behind the two panels on the right (fig. 3) is the long-wave transmitter (wave-length 355 meters), also consisting of four stages, together with the necessary instruments for electrical supervision and for supervision of the cooling-water.

In the modulating part of the transmitter the high-frequency energy of the transmitting valves undergoes modulation for speech or music. The modulator is located in the center-piece; (fig. 5) gives a view of the modulating part. The switchboard is also mounted in the center-piece. On the middle panel are the am-

meteres and voltmeters. in addition to safety devices, fuses, etc. In the left-hand part are, among other instruments, the checking meters for the rectifying part of the short-wave transmitter and for the converter which furnishes the direct current for the filaments of the valves, various switches, etc. The right-hand part contains the same instruments for the long-wave transmitter.

On the operating desk (fig. 3) we find, in addition to the modulation-checking instruments, two telephone line amplifiers and a suprevisory receiving apparatus, as well as a few press-buttons by means of which, in case of emergency, various parts of the transmitter or the entire installation can be made dead.

Leading from the operating desk is a private cable to the studios, which are located on the third floor of the Phya Thai Palace on the other side of the road.

Here are three studios, equipped on modern lines, and an amplifying room.

The Phya Thai station is in every respect a modern broadcasting station, and as soon as the experience gathered during the experimental transmissions will have been noted and taken into consideration, Siam may boast of possessing a transmitter which will afford pleasure to listeners far beyond the boundaries of that kingdom.

The Philips Radio Ltd, of Eindhoven, Holland, is represented in China by the Philips China Company, 41 Szechuen Road, Shanghai.

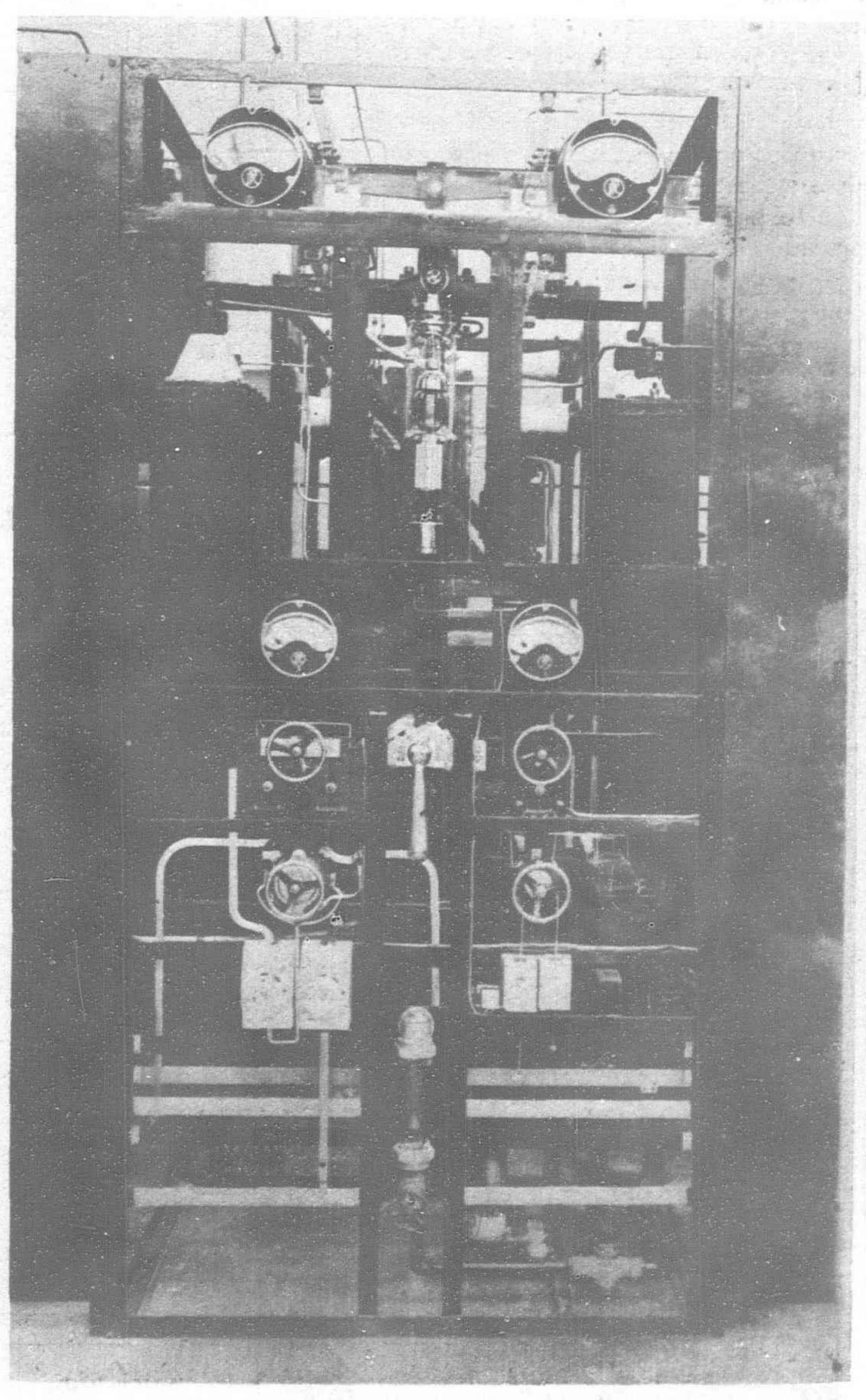
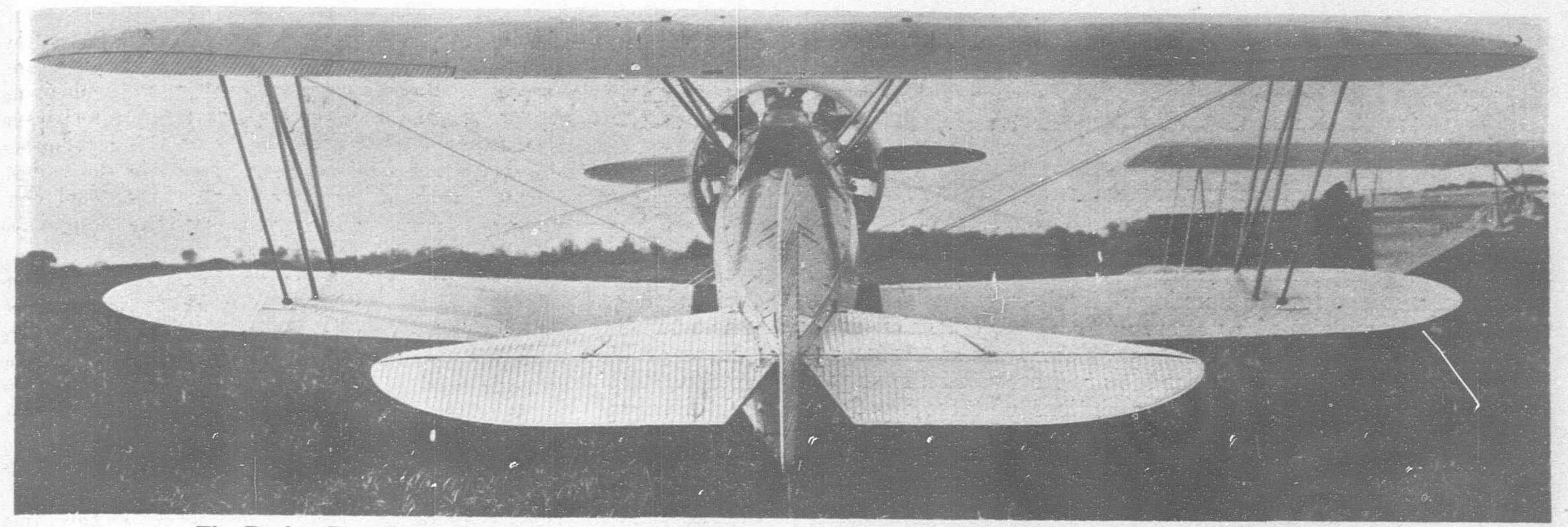


Fig. 5 .- Modulator Part of Transmitter



The Boeing Pursuit Plane which can Climb Two Miles and Dive Back to Earth in about Five Minutes

Boeing Pursuit Plane Tours China

now in China will soon leave for a tour of the principal aviation centers, where it will no doubt create great interest among Chinese aviation authorities. This plane can fly from Shanghai to Nanking in less than fifty minutes, and from Nanking to Peking in less than four hours.

The type of work done by these pursuit planes requires great maneuverability as they have to climb to heights of thirty thousand feet and there wait for the opportunity to dive at tremendous speed on the unsuspecting victim below. At this height the small Boeing is not visible from the ground and thereby becomes a very formidable antagonist able to swoop down on its prey and by its speed outdistance any plane sent to overtake it. In other words this plane can select its field of action.

Up to the present time there have been none of these pursuit planes used in military work in China, but they have for years been the standard for the army and navy of the United States and many other foreign



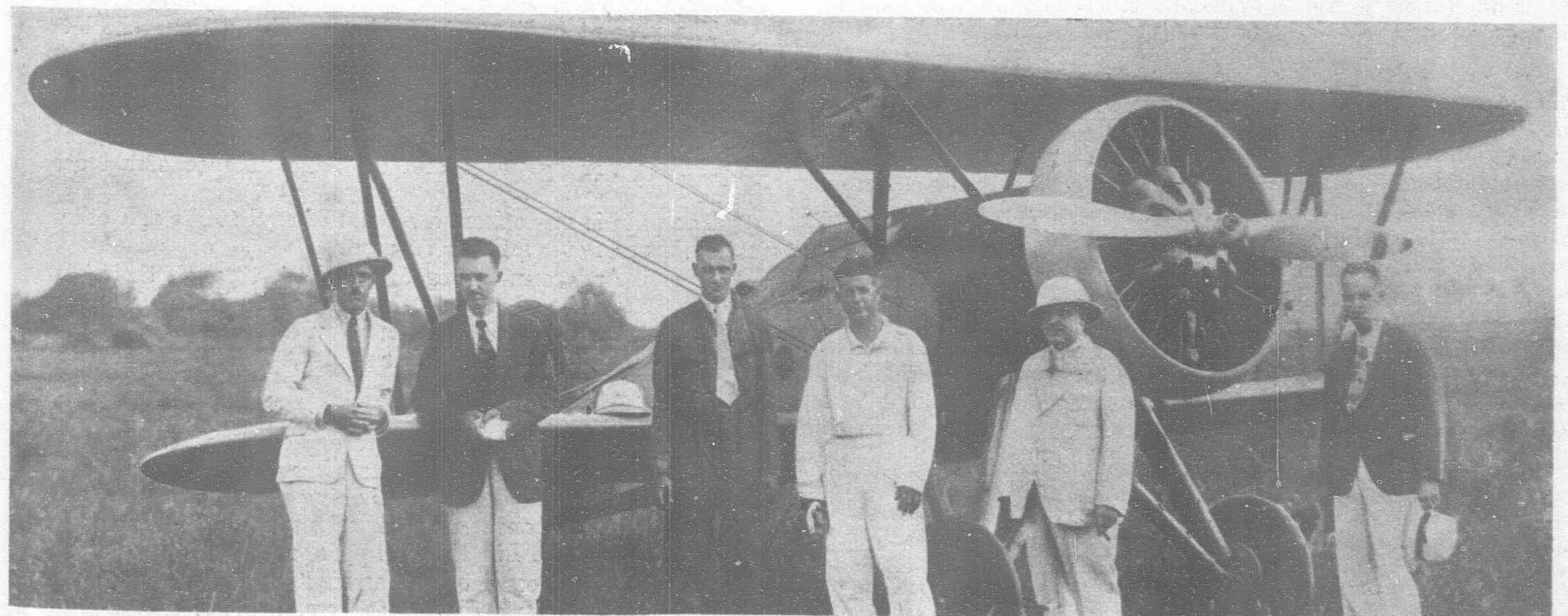
Major T. H. McConnell

governments. One is now in Japan for examination by the Government of that Empire, and others were recently sent to South America for service there.

The power plant of this airplane is the well known Wasp (Pratt & Whiteny) engine, supercharged with ten to one blower gear. This permits the plane to develop the required horse power in the high altitudes at which its most valued service is performed.

The introduction of this type of plane into China opens a new era in advanced aeronautics, and the air force which possesses a squadron or more of these machines will be in a position of great superiority.

This plane is manufactured by the Boeing Airplane Co. of Seattle, Washington. The Boeing Airplane Company is one of the divisions of United Aircraft & Transport Corporation, whose export division, United Aircraft Exports, Inc. is now opening an office in China after a study made on the ground by their vice-president, Major Thomas H McConnell. The local offices will be in charge of Mr. E. B. Haines at No. 6 Szechuen Road, Shanghai.



A Front View of the Boeing Pursuit Plane with, Left to Right, Mr. E. B. Haines, Representing United Aircraft Exports, Shanghai; Major E. P. Howard, U.S. Trade Commissioner, Shanghai; Mr. J. A. Barr, Pilot, Boeing Airplane Co.; Major T. H. McConnell, Vice-President, United Aircraft Exports, New York; Mr. L. E. Gale, President, L. E. Gale Co., Shanghai, Local Dealers for United Aircraft Exports

Three New Engineering Projects

projects that are being carried out by Messrs. Andersen, Meyer & Co., Ltd. Three outstanding examples of enterprises going forward under direction of this firm are the building of a bridge for the Sunning Railway over the Tam River in the Toishan District of Kwangtung Province, extension of the plant of the Kwangtung Electric Supply company at Canton and the erection of a new paper mill for the Liu Ho Paper Mill company at Antung in Manchuria. Brief descriptions of these three projects are of interest.

Sunning Railway Bridge

One serious obstacle to the further development of the Sunning Railway in the south of China has been the crossing of the Tam River.

The railway has for several years worked on plans to build a bridge across the river at Kung Yet, and in June this year the plans were realized and the contract for the construction of the bridge placed.

The bridge has a steel superstructure and is a single track through truss span railway bridge with eight fixed spans and one opening span placed in the middle. The piers and abutments are reinforced concrete. The fixed spans are 162 feet center to center of bearings and the opening span is a Scherzer Rolling Lift Bridge 71 feet center to center of piers. The total length of the bridge is 1,388 feet center to center of bearings on abutments.

The width of the bridge is 16 feet and there are two five feet side walks outside the trusses. The whole bridge is planked with hardwood boards and can, therefore, be used for light vehicular traffic.

Seventy per cent of the length of the bridge is over water averaging 40 feet in depth at high water. The river bottom is fine and coarse sand overlying a strata of hard clay. The piers will be resting on this strata of hard clay.

The contract for the construction of the bridge was awarded to McDonnell & Gorman of Tientsin, Bridge Builders and General Contractors. The design of the bascule is carried out by the Scherzer Rolling Lift Bridge Co., New York; the design of the fixed spans is carried out by the American Bridge Co., a subsidiary Company of the United States Steel Corporation, who also supply the structural steel and operating machinery.

The design, superstructure, machinery and equipment are supplied through Andersen, Meyer & Co., Ltd., Shanghai, who also act as Consulting Engineers.

The work on the building site was commenced in June this year and the bridge will be completed early in 1933.

Electric Plant at Canton

The plant of the Kwangtung Electric Supply Plant at Canton at the present time consists of two 2,500 kw, one 5,000 kw. and one 6,000 kw. turbo generators complete with the usual accessories and with six boilers two of which are equipped with pulverized fuel and one with oil burner. Messrs. Andersen, Meyer & Co. have recently sold and there is now being installed a boiler of 10,000 sq. ft., heating surface manufactured by the Heine Boiler Co., a subsidiary of the Combustion Engineering Corporation of New York, which will have a capacity of 80,000 lbs., of steam per hour at 250 lbs., pressure superheated to 200°. The superheater is of the Superheater Co., of American manufacture. The boiler will be equipped with a Riley Stoker Corporation Harrington Travelling Grate stoker with forced draft and induced draft fans.

Two rather novel features in this new installation will be a Green Fuel Economizer Co.'s cinder catcher located between the boiler smoke outlet and the induced draft fan to eliminate what has proved to be a considerable nuisance, i.e., the flood of cinders and fine particles of ash over the neighborhood. The other feature is the Girtaner steam ash ejector by means of which the ash from the ash pits will be blown directly into a receptacle where it can be removed by mechanical means at a considerable distance from

the boiler itself. The bunker system and coal conveying system are being extended to accommodate the new boiler.

The total capacity of the plant is now being increased to 22,000 kw. by the addition of a new 6,000 kw. turbine and condensing equipment, exact duplicates of the present 6,000 kw. unit. All of the turbines are of General Electric manufacture and the condensers of Worthington Pump & Machinery Corporation's manufacture. The turbine generates at 2,300 volt, 60 cycle, 3 phase, and distributes to a rapidly increasing load in Canton. Each turbine is equipped with a steam flow meter for checking steam consumption and the new turbine will have a direct connected exciter whereas all the older turbines have separate excitation. Considerable increase in switchgear has been made necessary by the continually increasing load and increased capacity of the plant, and this also is being supplied by the General Electric Co.

New circulating pumps for the condensers are not being supplied as the two circulating pumps for the first two units are being rendered practically double in capacity by the simple changing of the impellers and motors, effecting thus a considerable saving in first cost and without any loss in economy.

All of the old turbines have been provided with air washers of the Spray Engineering Co's manufacture for cooling and washing the air for ventilating the generator. The new turbine, however, will be equipped with a General Electric Co. surface air cooler through which the air for ventilation is continually circulated and cooled.

One of the outstanding advantages of this type of apparatus is the small amount of air available in the ventilating circuit for combustion in case of a fire on the generator windings. The circuit being entirely closed, any fire starting in the windings will quickly exhaust all the oxygen available and be automatically smothered. Another outstanding advantage is the absolute impossibility of moisture being present in the cooling air; and, of course, no power is required for operating a surface air cooler, except the small amount required to pump the additional water for cooling, this water being taken from the circulating water mains.

The Kwantung Electric Supply Company's plant, although considerably pressed for room for expansion, has nevertheless maintained a high standard of equipment and has always been under very efficient management so that very excellent economies have been produced. These economies will undoubtedly be even greater with the new steaming and generating capacity which are now being installed on order to Messrs. Andersen, Meyer & Co., Ltd.

New Paper Mill in Manchuria

The present equipment of Liu Ho Cheng Paper Mill Co. of Antung, Manchuria, was supplied by Japanese manufacturers who erected the same and put it into operation. The present output is about $2\frac{1}{2}$ tons per 24-hour day of good paper. Two grades are made: white and unbleached or tan, which are used for Chinese writing paper and to make notebooks and account books.

The pulp is made from a species of reed stalks and other raw materials are not available or used.

Messrs. Andersen, Meyer & Co., Ltd. through their Mukden Office recently signed a contract with the Liu Ho Cheng Paper Mill Co. for the sale and erection of an extension to their present plant, capable of producing 10 tons of 2,240 lbs. of bleached paper per day.

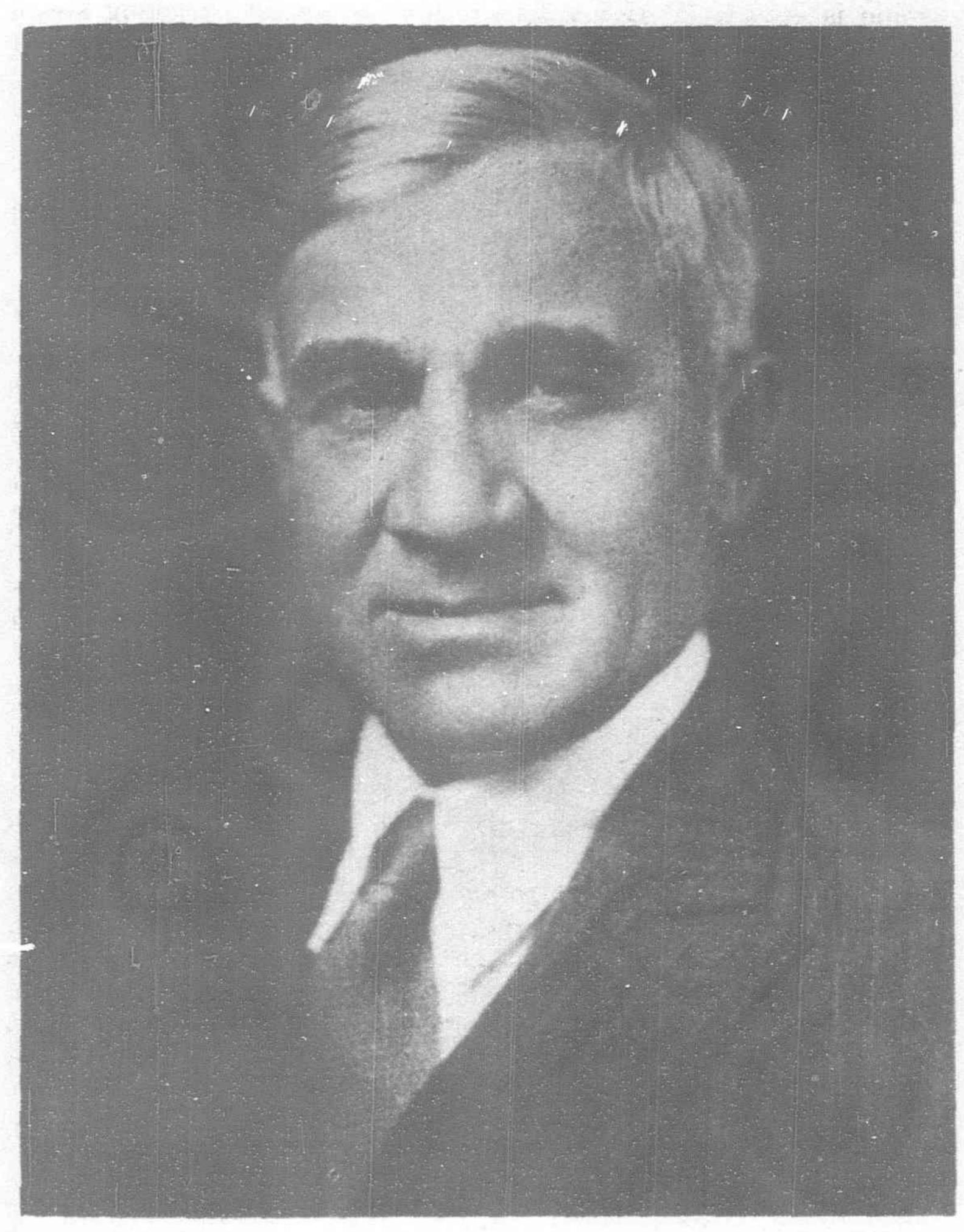
The paper mill machinery is being supplied by James Bertram & Son Ltd. of Edinburgh, who are one of the foremost engineers specializing in paper making machinery. They have supplied about 90 per cent of the paper making machinery now in use in India and have had considerable experience in handling raw materials such as used by the Liu Ho Cheng Paper Mill Co.

The new plant consists of the usual cutters, dusters, digesters, washing and heating engine, bleachers, beaters, chemical house, paper making machine and finishing house.

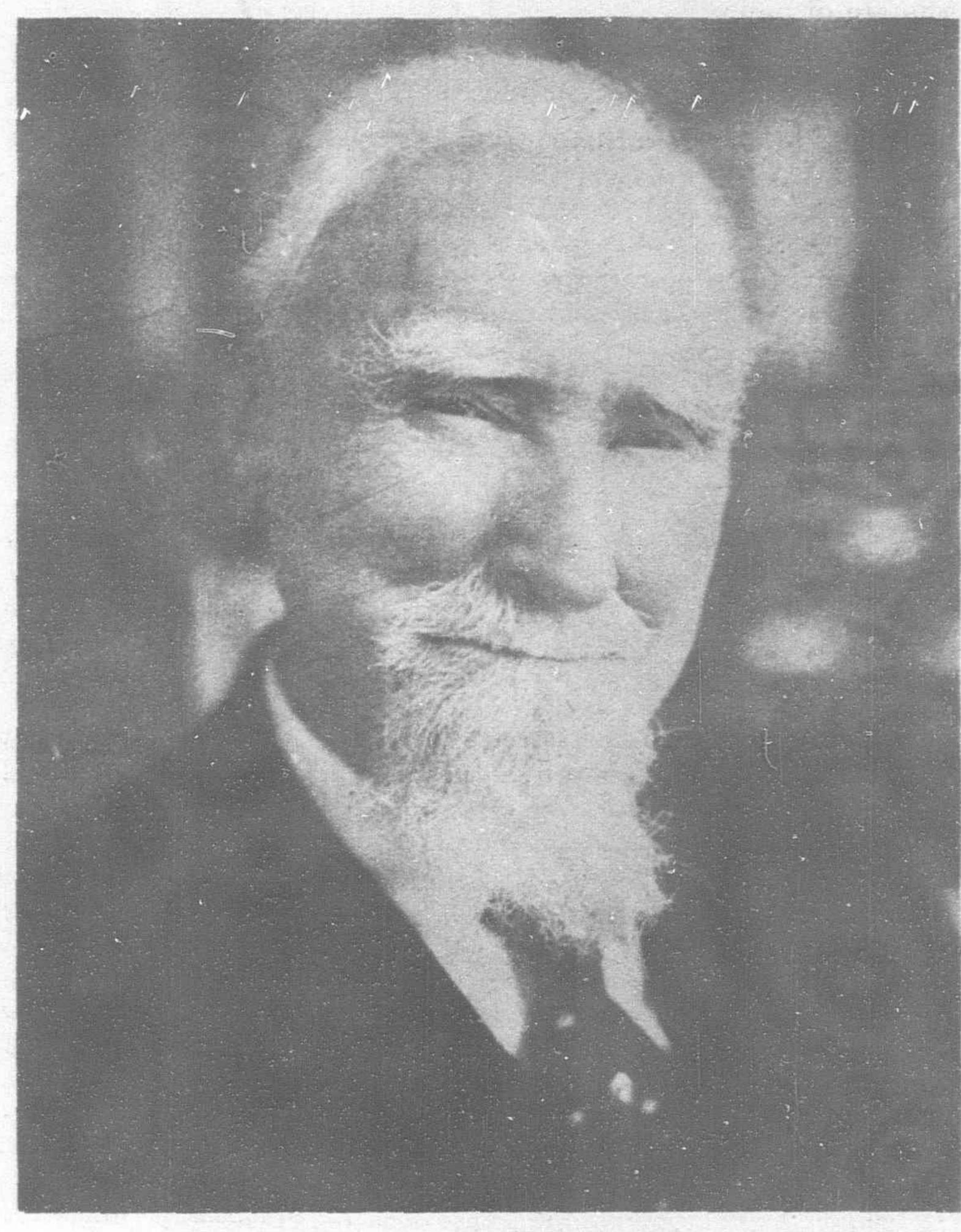
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The Asiatic Marine Review

America's Master Shipbuilder and Master Mariner



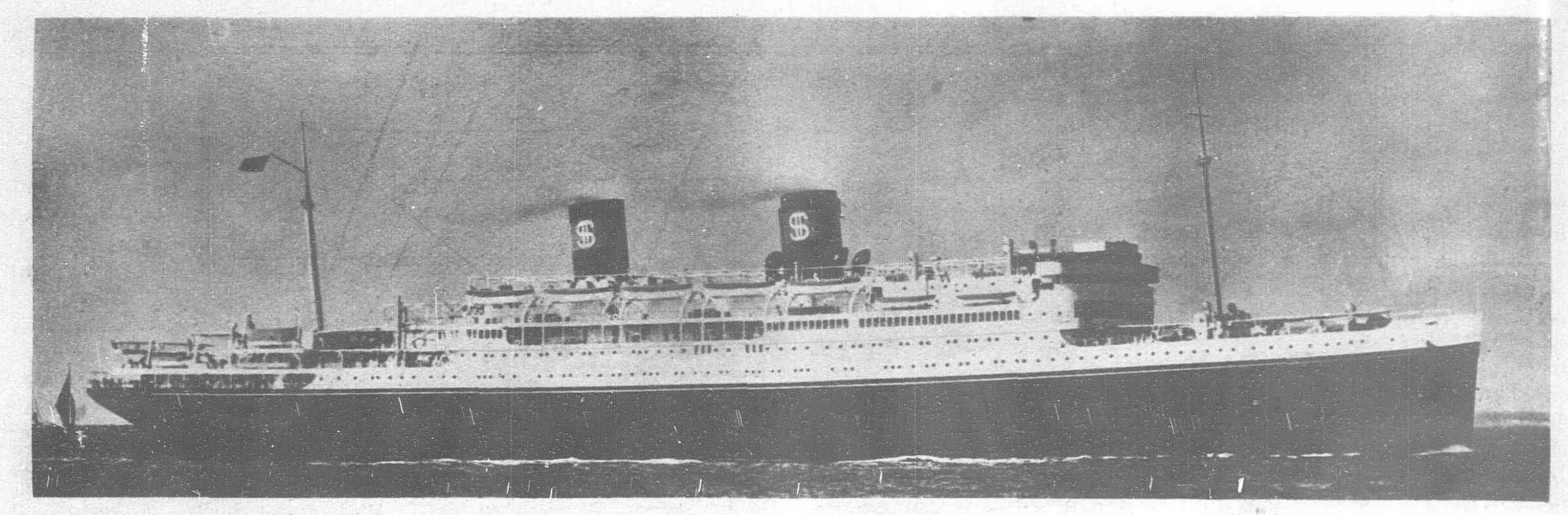
Homer L. Ferguson, president of the Newport News Shipbuilding and Dry Dock Company, Builder of the New Ships



Captain Robert Dollar-The Grand Old Man of the Pacific, and Genius of the Line that bears His Name

GENERAL PARTICULARS

Length overall	 	654'-3"	Displacement at bottom of bar keel 33,	350 tons
Length on 32' water line	 	630'-0"	Tons per inch at bottom of bar keel 9	4.9
Length between perpendiculars (classification)	 	615'-0"	Midship Section coefficient	979
Beam, molded		81'-0"	Block Coef. (on w.l. length)	375
Depth, molded, to Boat Deck, at side	 	79'-6"	Gross Tennage 21,)36
Depth, molded, to Promenade Deck, at side	 kin w	70'-0"	Net Tonnage 12,)86
Depth, molded, to Bridge Deck, at side	 	61'-0"	Capacities:	
Depth, molded, to Shelter Deck, at side	 	52'-0"	Fuel oil (all available tanks) 6,	240 tons
Depth, molded, to Upper Deck, at side	 * *	41'-9"	Water ballast (all available tanks) 5,	670 tons
		32'-9"	Cocoanut oil (tanks available for fuel or cocoanut oil) 1,	181 tons
Height between Lower and Main Decks	 	8'-3"	Fresh Water 2,	320 tons
Height between Orlop and Lower Decks		8'-3"	General cargo—bales 556,0)00 cu. f
		34'-0"	Refrigerated cargo 59,	600 cu, f



The "President Hoover" on Trial Course Developing 22.2 knots

A Triumph of American Shipbuilding

The New 22,000-Ton Turbo-Electric Floating Palace "S.S. President Hoover" Built by the Newport News Shipbuilding and Dry Dock Company for the Dollar Steamship Company's Trans-Pacific Service

the new steamship President Hoover, built for that world-famous shipping company by the Newport News Shipbuilding and Dry Dock Company, marks a high spot in American shipbuilding. There are a number of interesting things about this vessel and its sister ship President Coolidge (now under construction at Newport News, Va., by the same builders and to be delivered in October), which call for considerably more than passing notice. Not the least of these is the fact that they are the largest mercantile ships that have ever been built in America. Their distinguished sponsorship at launching and the special christening liquids used were widely heralded in the public press, as well befitted the occasions.

While the general design of the vessels does not contain many distinct departures from generally accepted practice in vessels of similar type, there are several distinctive American features embodied which make them outstanding ships. Prominent among these is the electric propulsion, which certainly can be claimed to be an outstanding contribution to modern marine machinery by an American engineer. These two ships, the latest of a rapidly growing list of electrically propelled vessels, have the most powerful electric power plant so far applied to an American merchant ship. They are also the first all-electric ships to enter the trans-Pacific trade and thus open up a new era of modern sea transportation between the fertile West and the Orient. The electric plant on the President Hoover was supplied by the General Electric Company, while the one on the President Coolidge was supplied by the Westinghouse Electric and Manufacturing Company. Experience has shown that vessels fitted with turbo-electric machinery are relatively free from vibration, which adds appreciably to their popularity with the traveling public.

Another feature, in which America may rightly claim the credit for setting the pace, is the extensive bathing facilities provided on these vessels, especially those for 1st class passengers. The number of private baths and toilets in proportion to the passengers carried is greater than in any vessel afloat. That this is no exaggeration may be gleamed from the fact that with only one exception all of the 112 first class state rooms have either a private bath or are directly connected to one. These baths are all beautifully tiled and fitted with the most modern plumbing fixtures in attractive colors, as well as with a complete line of toilet accessories. Supplementing these there is a large completely tiled open-air swimming pool with a sand beach and sun deck adjoining. This pool is for the exclusive use of first class passengers, is very conveniently located at the boat deck level, and has an awning fitted over it. There is also an open-air swimming pool for special class passengers.

Still another distinctive American feature, which is now being used to some extent in modern foreign-built ships, is the soda fountain room. This is not merely a soda fountain bar, but is a fully equipped, attractively furnished ice cream parlor similar to the best type ashore. Its convenient location off the marine tea garden, or dancing pavilion, will no doubt make it one of the most popular resorts on the ship, particularly during warm weather.

The extent of the public spaces and the use of special woods in their interior design are impressive. Practically all the enclosures on the promenade deck are devoted to public spaces, comprising a library and reading room, lounge and ball room, smoking room, lobbies, marine tea garden, etc. Some idea of their size may be obtained from a statement of some of their dimensions: the lounge is 51-ft. by 48-ft. entirely clear of any obstructions whatever, the smoking room is 48-ft. by 48-ft., and the tea garden or dancing pavilion is 29-ft by 78-ft., also entirely free of pillars. In all of these rooms the deck height is 13-ft. 6-in. which adds greatly to their roomy appearance. All of these spaces, as well as all the stair lobbies throughout and the special class public spaces, are attractively designed, with special woods a prominent feature. The latter comprise avodiré, framiré, bubinga, eroké and African mahogany from the West Coast of Africa; padouk and teak from Burma; satinwood from India; harewood from England; prima vera from Central America; Philippine mahogany (so-called) from the Philippine Islands; Circassean walnut from Russia; Zebra wood from Brazil; and domestic woods such as oak, walnut, cherry, maple, etc. Mention should also be made of the 1st class diningroom on the upper deck, in which a deck height of 10-ft. 3-in. and a large open well over the center of the room make an exceptionally attractive high-ceilinged room. A stock-quotation board room is another of the modern features.

The term "all electric" as applied to these ships is appropriate. In addition to the electric propulsion, electricity is used for all cooking appliances, heating, motive power for ventilation fans and various deck and engine room auxiliaries, as well as for lighting

and general power purposes.

The general design of the President Hoover and Peesident Coolidge was prepared by the staff of the Newport News Shipbuilding and Dry Dock Company in close co-operation with the Owners and their staff, to meet the special requirements of the trans-Pacific and around-the-world service. It embodies the ideas and the extensive experience of the Owners in that service as well as anticipates future requirements. The keen foresight of the veteran Captain Dollar, which is well illustrated by his success in developing the service from a small beginning into its present world-wide popularity and large proportions, is again demonstrated in the

ordering of these splendid ships, which it is confidently expected

will quickly achieve the popularity their merits warrant.

The vessels were designed to meet specific requirements for speed, deadweight and cubic capacities, passenger accommodations, etc. They comply with the requirements of the Postal Service for Class II mail-carrying, U.S. Navy requirements for auxiliary service, U.S. Public Health Service requirements for rat-proofing, fresh water piping, etc., U.S. Steamboat Inspection Rules and Regulations, International Convention (1929) on Safety of Life At Sea Regulations, and the Rules of the American Bureau of Shipping under whose special survey they have been built. All detail plans were prepared by the shipbuilders and the responsibility for meeting all the foregoing requirements is entirely theirs.

The design of the architectural features and all interior decorating and furnishings is the work of the A. F. Marten Company of San Francisco, who were employed by the Dollar Steamship Lines for that special purpose. The splendid manner in which they fulfilled the trust reposed in them is well attested by the results obtained.

Sub-contractors for the main propulsive generators and motors, the General Electric Company in the case of the *President Hoover*, and the Westinghouse Company on the *President Coolidge*, are entirely responsible for the design of the machinery furnished by

them to meet the specified power.

The design of the President Hoover and the President Coolidge constitute a splendid example of close and cordial co-operation between owner and builder. The Dollar Steamship Lines expressed their ideas as to the size and equipment of the vessels they desired and permitted the Newport News Shipbuilding and Dry Dock Company to work out the problem. Carl E. Petersen of the Shipbuilding Company worked closely with the Directors and operating Officials of the Dollar Steamship Lines at San Francisco to design vessels specially adapted to the requirements of their services. After the award of the building contract, detailed plans were developed, also in co-operation with the owners, and important details of the final design were worked out under the direction of H. F. Norton, Naval Architect and J. F. Nichols, Chief Engineer at Newport News. The interior architecture and interior decoration and furnishings were conceived and carried out by A. F. Marten & Co. of San Francisco, under the personal direction of F. E. Baldauf of that firm.

General Description

Vessel is of the complete superstructure type with five fully plated decks in the hull, a combined forecastle and bridge deck, and promenade and boat deck over about 50 per cent of the ship's length. In all there are nine decks, of which number seven are either wholly or partially devoted to passengers. The side plating amidships is carried up to the promenade deck to form part of the enclosure for state rooms on the bridge deck. There are three tiers of steel erections above the bridge deck and above these is the wheel and chart-house which is of teak construction. The deck inside of the erections on the boat deck is 4-ft. higher than on the outside, in order to give greater headroom in the public spaces on the promenade deck. The promenade and boat decks overhang the sides of the vessel 18-in. and the navigating bridge, which is at the level of the top of the boat deck house (95-ft. above the keel) extends 3-ft. beyond the maximum beam on each side, in order to give an unobstructed view of the entire length of the vessel.

Vessel has a straight stem, slightly raked, and an elliptical stern of the protected rudder or semi-cruiser type; with these and the two well placed masts and two stacks the profile presents a very symmetrical appearance. The stern is bossed out for twin screw shafts. A complete double bottom is fitted which is utilized for the carriage of fuel oil and fresh water and is also to a large

extent available for carrying water ballast when needed.

The subdivision of the vessel by ten transverse bulkheads provides three cargo holds forward, two boiler rooms, one engine room, and three cargo holds aft. Further subdivision is provided by the bulkheads bounding fuel oil tanks forward of the boiler rooms, at the sides thereof, and between the engine and boiler rooms, and by those bounding fresh water tanks abreast the shaft alleys. All cargo spaces are located below the upper deck. Forward there are twelve compartments all of which are used for general cargo, and aft there are five for general cargo, one for mail in bulk, and three for refrigerated cargo. The insulated compartments,

which are all in No. 4 'tween decks, are further subdivided into six smaller compartments on each of the orlop and lower decks, and on the main deck into three compartments for refrigerated cargo and several for ship's cold storage. There are thus 15 insulated compartments for refrigerated cargo, each one of which may be loaded or unloaded without in any way affecting the others. This arrangement is particularly advantageous for the service in which the vessel will be engaged since it permits of diversified cargoes being loaded or discharged at any port of call with a minimum amount of handling and without in any way disturbing through freight of a refrigerated nature.

All refrigerated cargo is handled through two trunked hatches extending through to the bridge deck, located one on port and one on starboard side of ship. At each of the cargo deck levels an athwartship passage 10-ft, wide connects the two hatches and provides a working space so that cargo may be loaded from either side of the ship into any compartment. General cargo carried in Nos. 1, 2, 5 and 6 holds is handled through weather deck hatches by booms at the masts. In addition to the main hatch in No. 2, there is a cargo port on each side between main and upper decks and two

wing hatches fitted in way thereof in the main and lower decks for the handling of special cargo of a light nature. At the after end of No. 2 main 'tween decks a separate compartment for the stowage of special cargo is provided; the bulkhead separating this compartment from the main space has two large sliding doors to permit of handling freight from one to the other. All cargo carried in No. 3 holds is handled through cargo ports of which there are two on each side in the main 'tween decks; two wing hatches extend through the main, lower and orlop decks. The main 'tween deck spaces in No. 5 and No. 6 are arranged so that either steerage passengers or cargo may be carried in them. No. 2 upper 'tween decks is reserved for the carriage of passengers; automobiles and a large

cargo port is fitted on each side of the vessel in way thereof through which they may be driven directly on board, or hauled in by means of a special capstan provided for that purpose. In addition to the carriage of miscellaneous bulk, dry and packaged cargo, provision is made for carrying a large amount of cocoanut oil in certain of

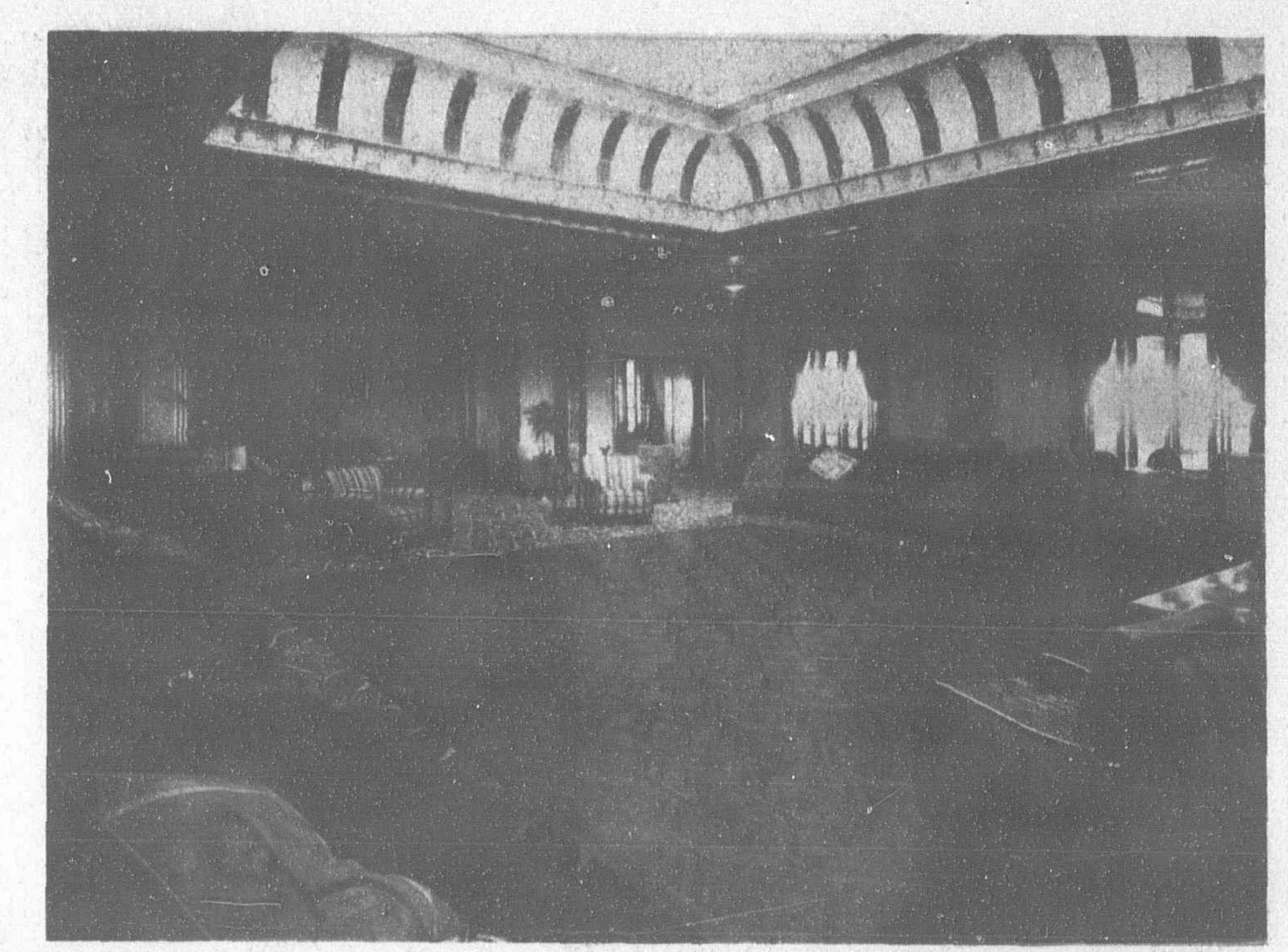
is made for carrying a large amount of cocoanut oil in certain of the tanks which normally are used for fuel oil. For particulars of hatches, winches, cargo booms, etc., see "Cargo Handling Gear."

Provision is also made for the carriage of mail and postal matter. For this purpose there is a fully equipped sea-post office on the upper deck with entrance from the special class lobby. A special enclosure for registered mail is fitted therein. Mail in bulk is carried in No. 5 orlop 'tween decks and a special mail trunk connects this space with the sorting room. Mail is loaded through No. 6 hatch the trunked portion of which adjoins the post office with which connection is made through sliding doors. Adjoining the post office and No. 6 hatch there is a special steel enclosed compartment for the carriage of specie, and another similar room for the same purpose is provided in the No. 3 main 'tween decks.

Accommodations are provided for four classes of passengers; 1st, special and 3rd classes, and steerage. In the regular 1st class spaces provision is made for 307 passengers and this number can be increased to a total of 440—1st class passengers by use of certain rooms which are interchangeable between 1st and special classes. The 1st class accommodations are all located amidships, with state rooms on five different decks. In the regular 1st class there are 108 state rooms, and four de luxe suites each consisting of a sitting room, verandah, state room and bath; trunk rooms are also provided for each pair of suites. The suites are located on the bridge deck two on each side of the vessel and adjoin each other. Two of them are also arranged so that the adjoining regular state room may become an integral part of them. Of the 108 regular state rooms eight are located on the boat deck, two on the promenade deck, 46 on the bridge deck, 38 on the shelter deck and 14 on the upper deck. With only one exception all these rooms have a private bath. There are 69 private bath-rooms and 11 private toilets with showers, and in addition 17 public bath-rooms and 11 shower baths for the exclusive use of regular first class passengers. Probably no other passenger ship affoat is equipped with so many baths in proportion to the number of passengers carried.

Public spaces for 1st class passengers are located on each passenger deck, and the promenade deck is devoted almost entirely to that purpose. On it, in addition to the lobbies at each of the two main stairways, are a library and writing room, lounge and ball room, smoking room, marine tea garden, soda fountain room, card room, and a stock-board room. The main dining saloon, seating





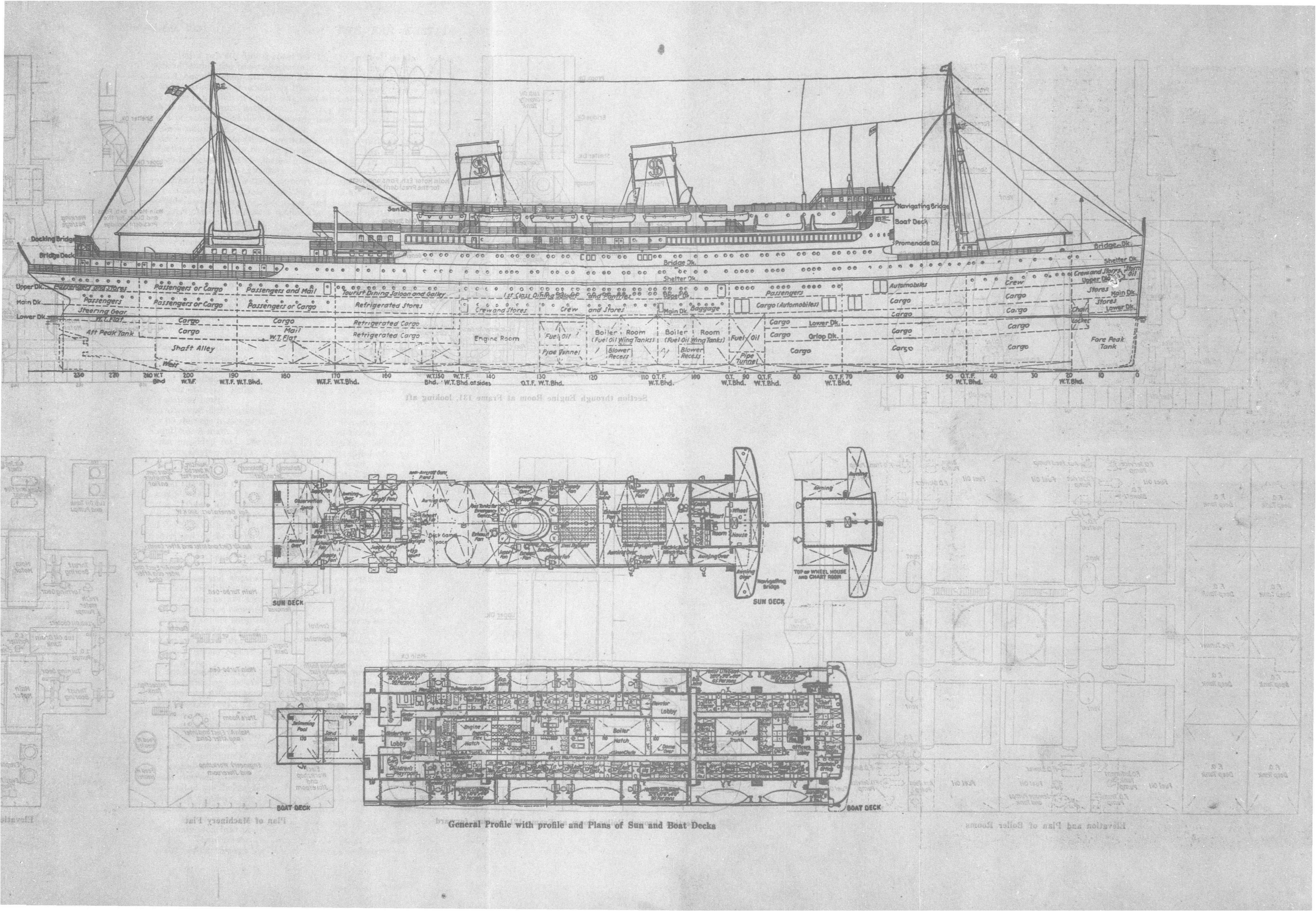
Topped by an Art Glass Dome in Pastel Shades, the First Class Lounge presents an artistic blending of green, gold, and mahogany with the subtle chartreuse tones of its wall and ceiling panels

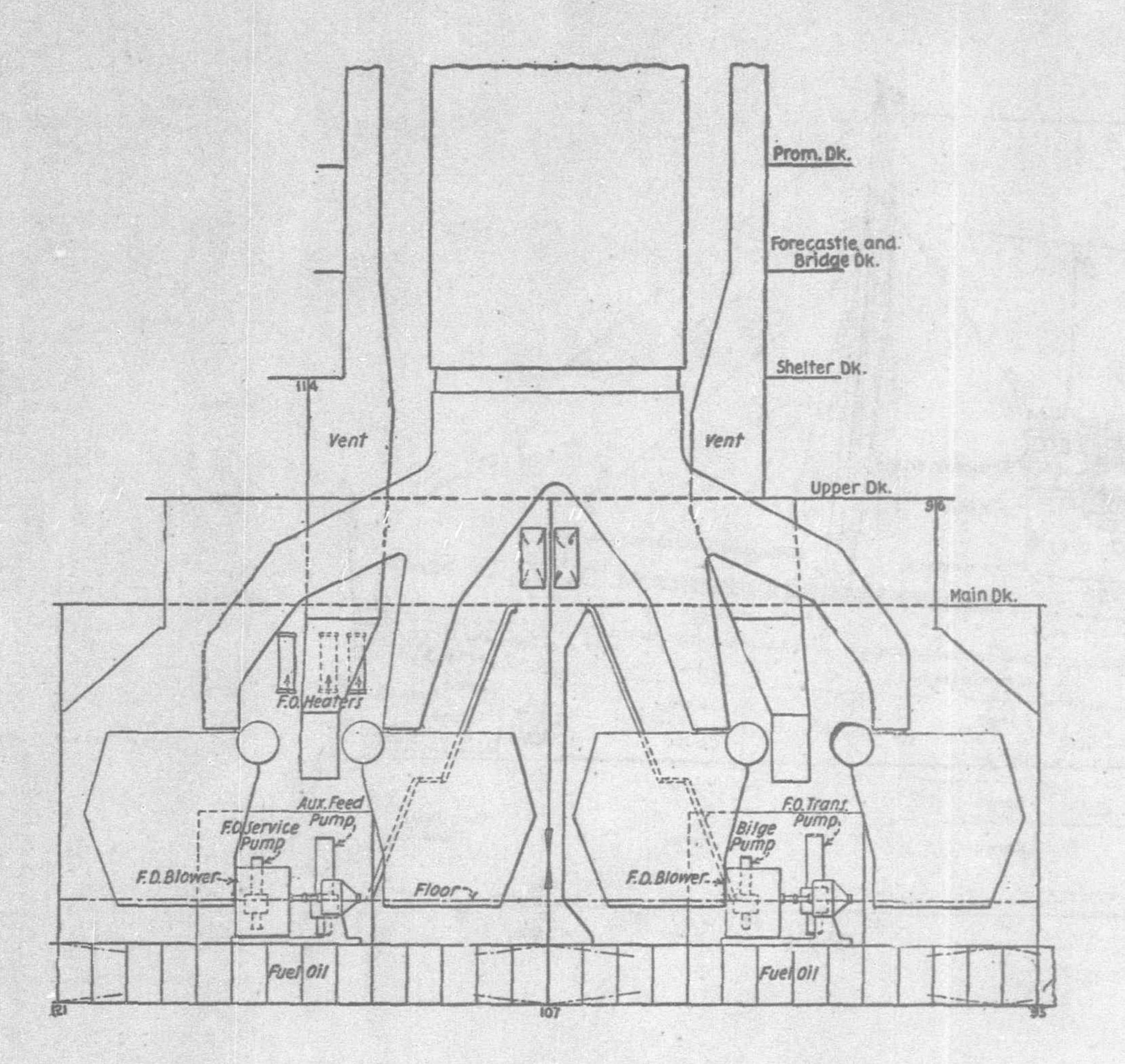


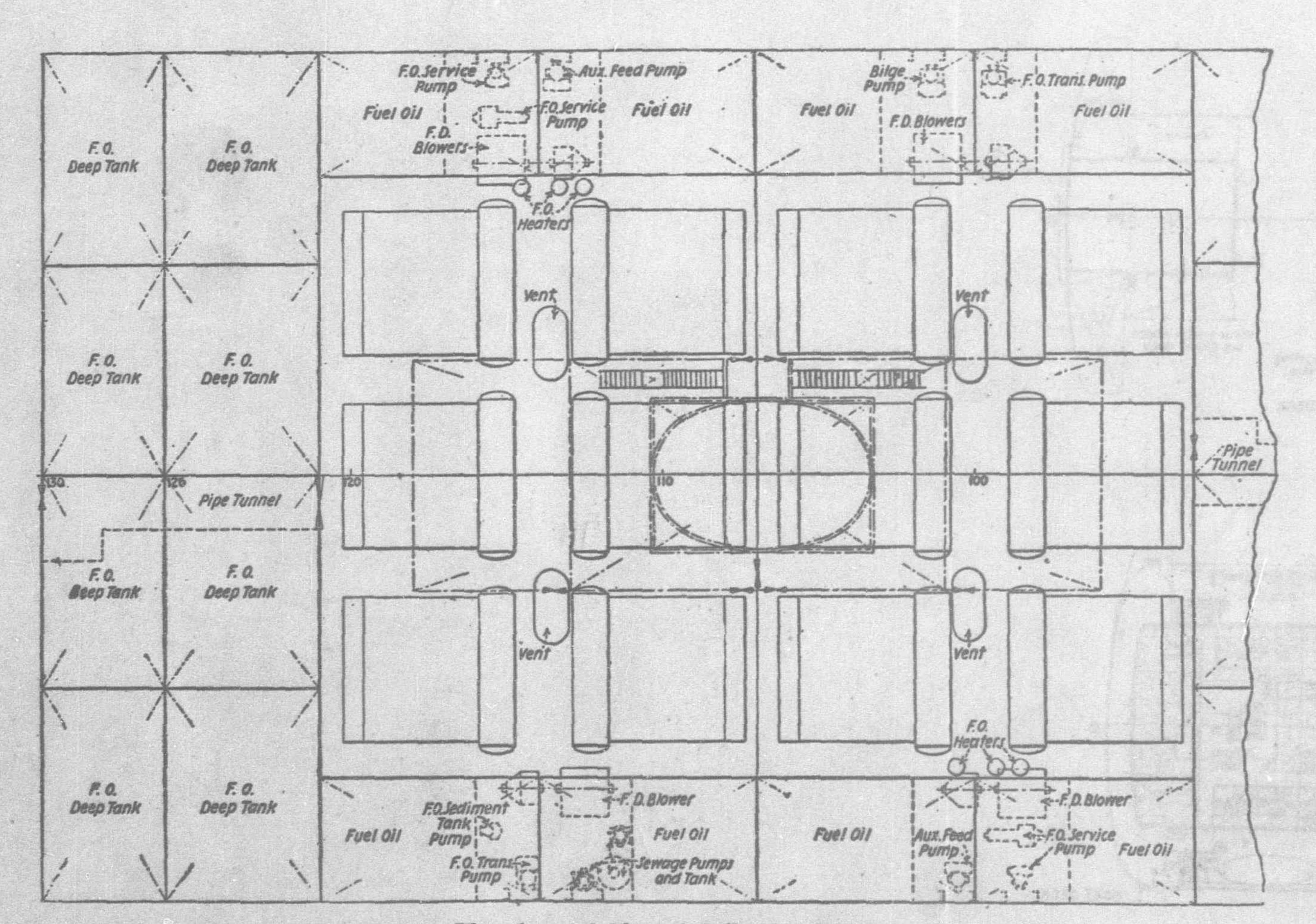
After End of First Class Lounge featuring carved glass and ebony console with



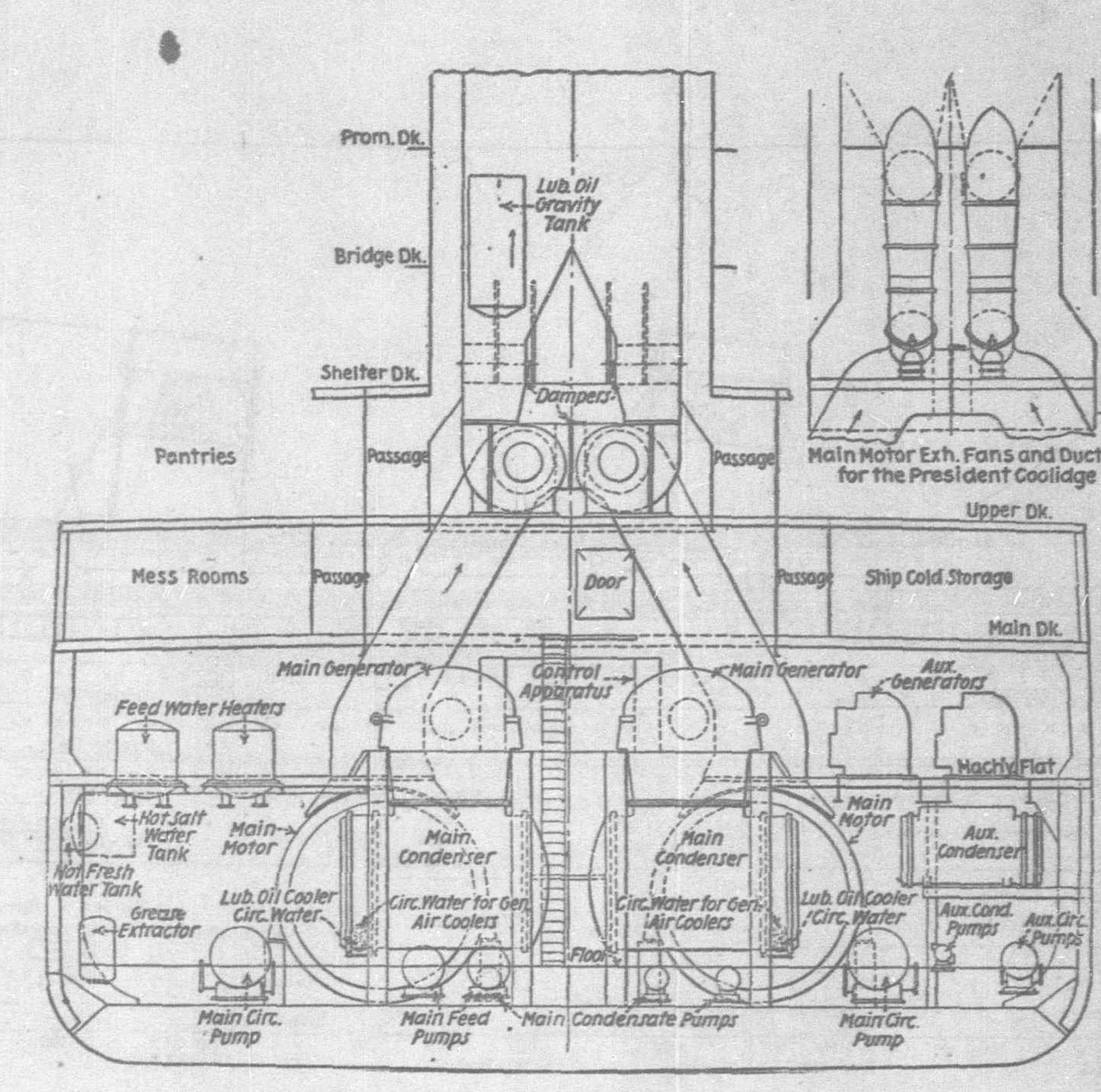
A beautiful apartment is the Library and Writing Room



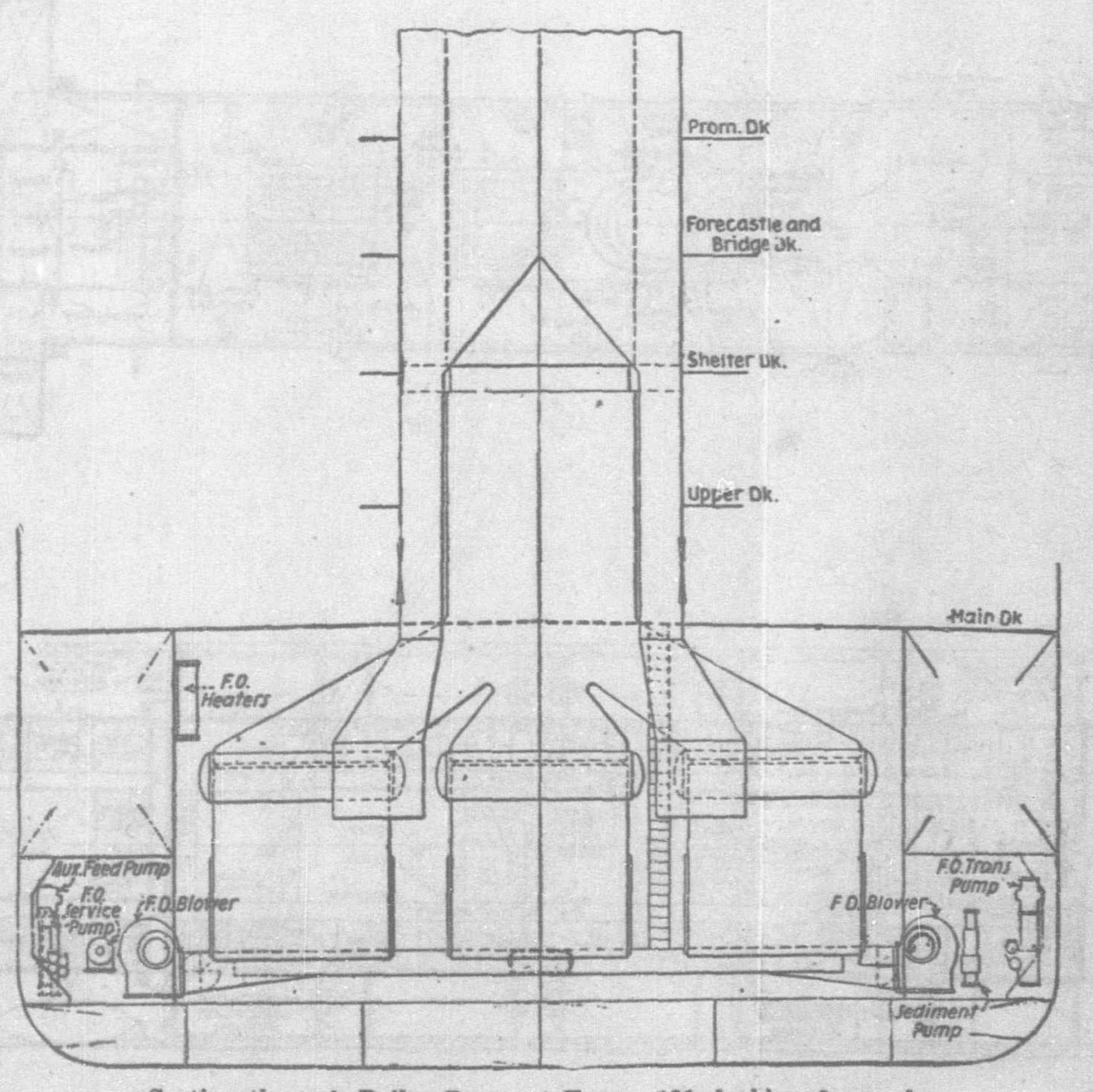




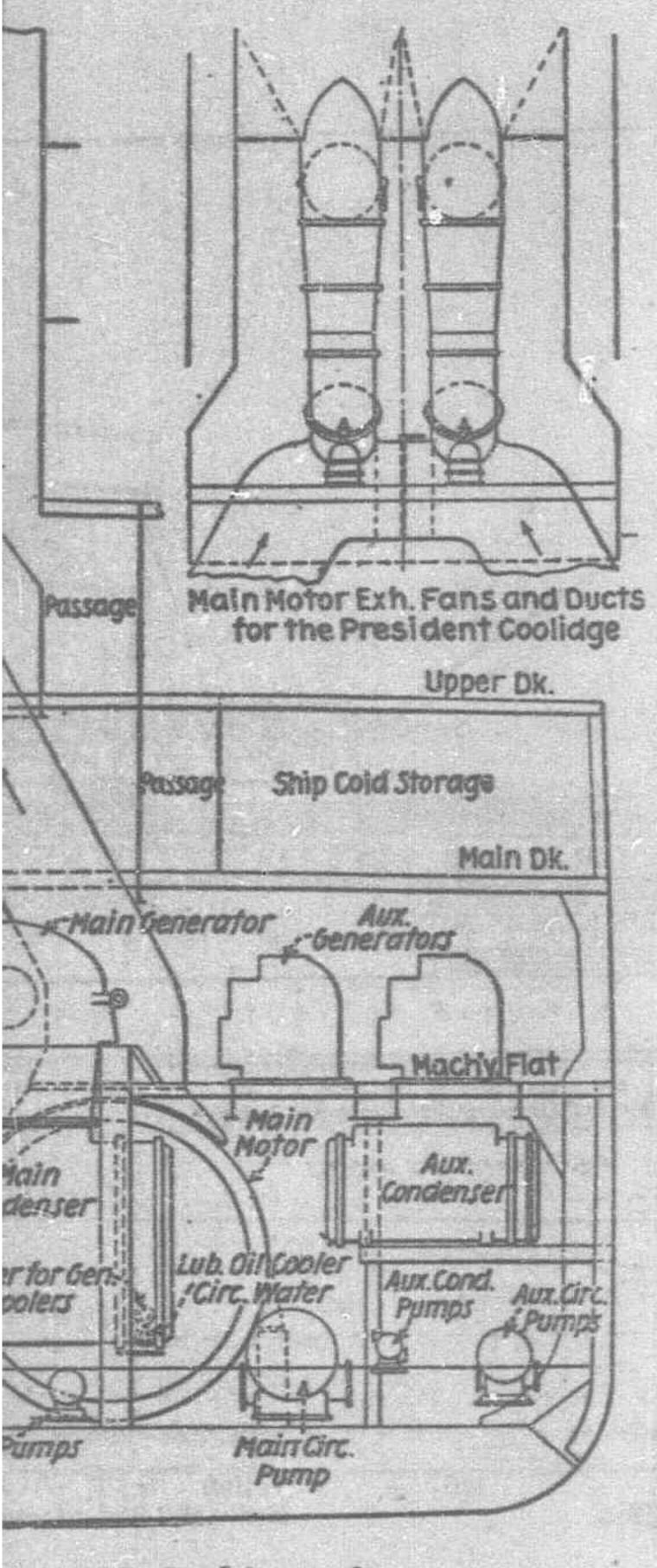
Elevation and Plan of Boiler Rooms



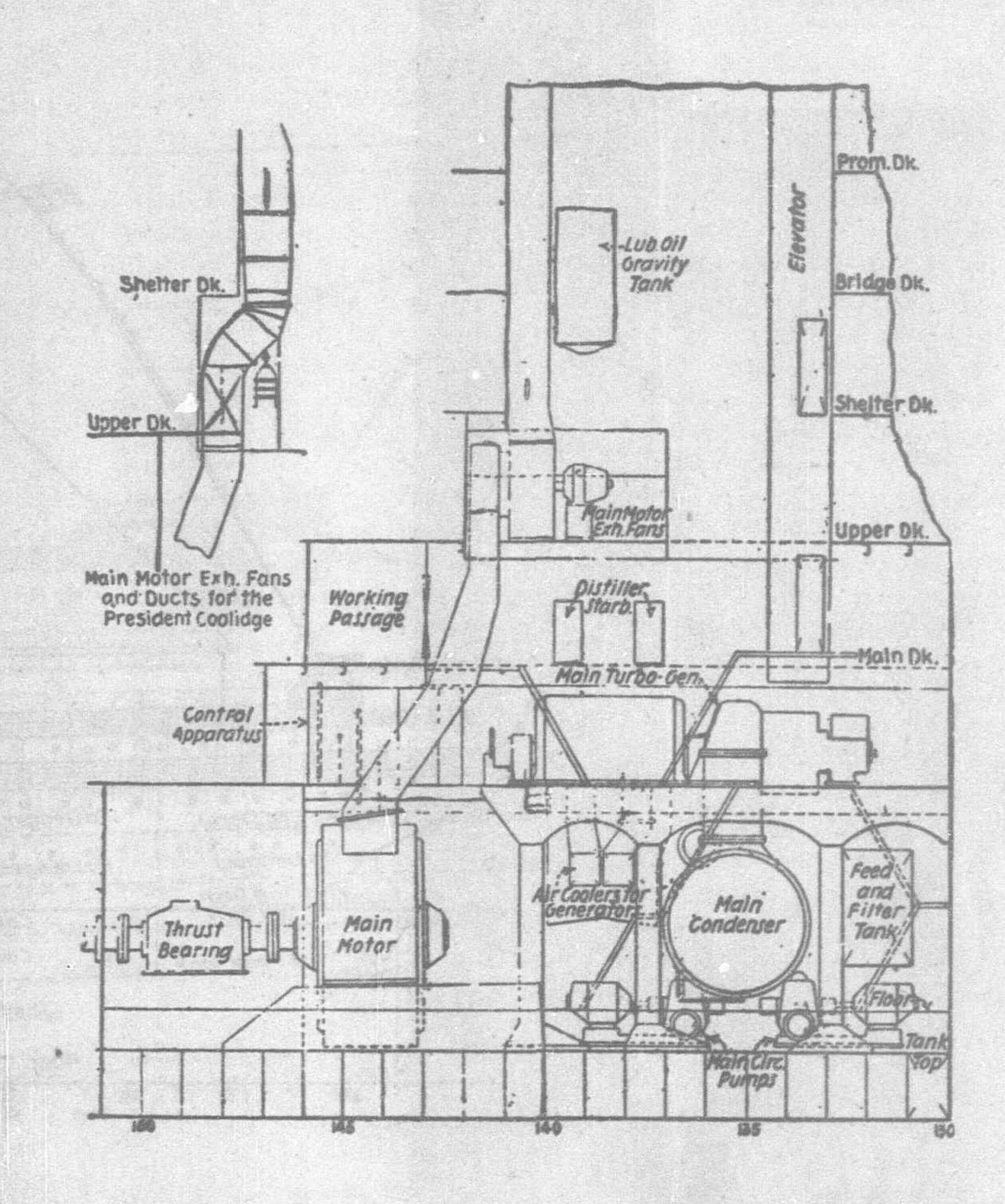
Section through Engine Room at Frame 131, looking aft

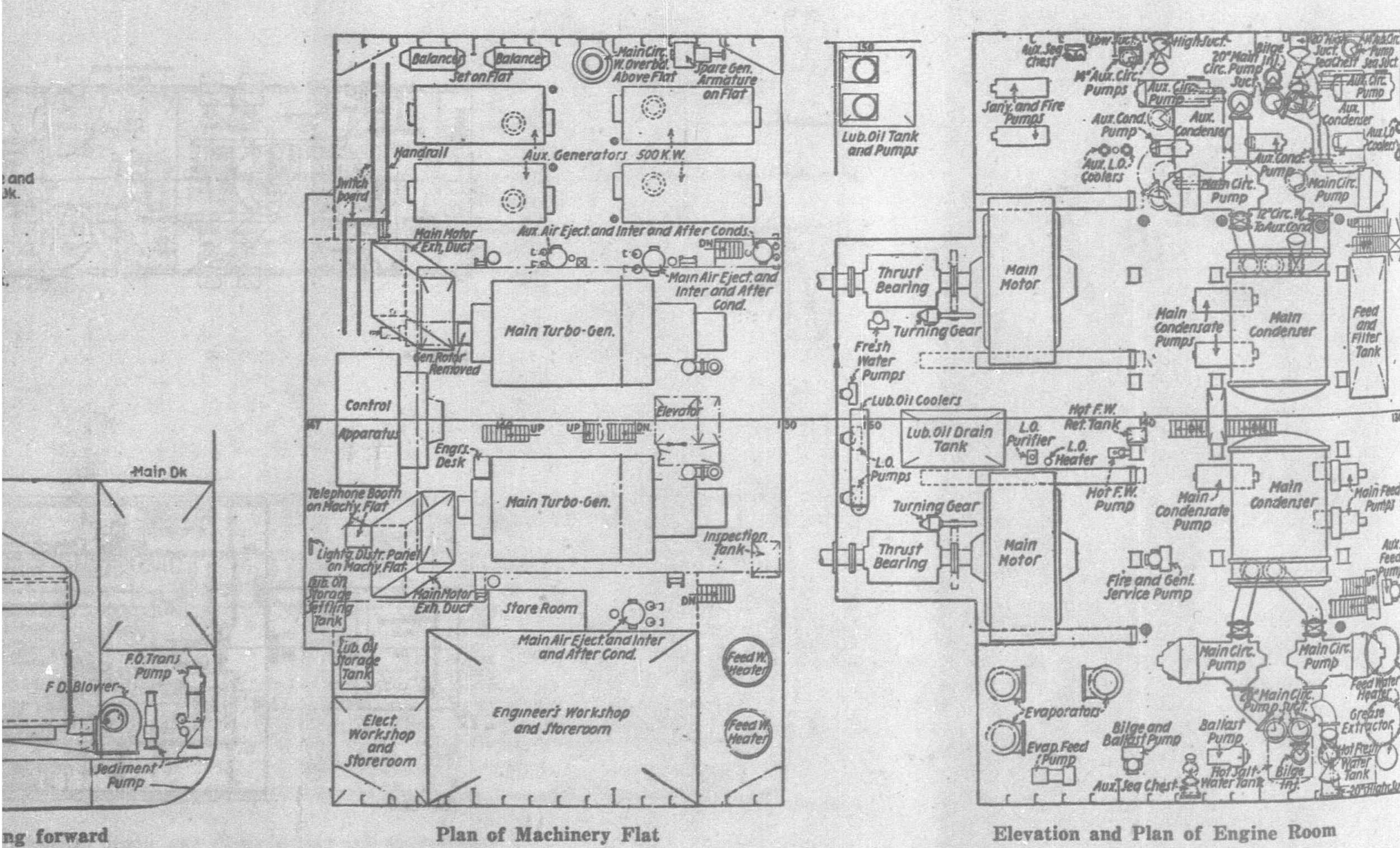


Section through Boiler Room at Frame 121, looking forward



me 131, looking aft





Plan of Machinery Flat

272 people, and a private dining-room for 18, are located on the upper deck adjoining the passenger entrance lobby at the forward stairway. A novelty shop and large lobby, also a barber shop and a beauty parlor, are provided on the bridge deck, and on the boat deck there is a children's playroom, and a gymnasium, adjoining which is a therapeutic bath-room. A very special and novel feature is a permanent out-door swimming pool with a sand beach and sun deck adjoining. There are deck game spaces on top of the boat deck house, weather deck promenade on the boat deck, and a wide sheltered promenade on the promenade deck, the forward end of which is enclosed with frameless glass windows. In addition to two large main stairways extending between the several passenger decks and grand stairway leading directly into the dining-room, there are two electrically-operated elevators off the forward lobbies which provide service between the upper and boat decks for 1st class passengers; the port elevator service also extends to the main deck providing direct access to the baggage-room on that deck.

State rooms for 133 special class passengers are all located on the shelter deck adjoining the 1st class quarters and the 39 rooms provided are interchangeable between the two classes. A smoking room and a lounge on the bridge deck, two large lobbies and a barber shop on the shelter deck, and a dining-room on the upper deck seating 120 persons are provided for the exclusive use of special class. A portion of the after end of the bridge deck is set aside for an open-air promenade and an out-door swimming pool is provided for their use in the trunked hatch to No. 5 hold. Six bath-rooms and seven showers are also provided for them.

Permanent accommodations for 170—3rd class passengers in 23 state rooms and a dining-room seating 114 persons are located at the after end of the upper deck. A social room is provided for them on the shelter deck, and the exposed part at the after end of the latter and the after end of the bridge deck are set aside for their use as open-air spaces. Toilet facilities include 11 shower baths

and one Japanese bath.

At the after end of the main deck there are permanent accommodations for 60 steerage passengers, and portable berths are provided in No. 5 and No. 6 main 'tween decks for 318 additional, a total of 378 being provided for. Permanent toilet facilities, including 14 shower baths are provided for steerage use. A hospital containing a dispensary and operating room, and men's ward, women's ward and an isolation ward, each having an attached bath-room,

is provided on the shelter deck aft.

Accommodations for a total ship's complement of 324 are provided for. These are located in different parts of the ship, those for the captain, deck officers, and most of the engineers being located on the boat deck, and those for the crew at the forward end of the shelter and upper decks and amidships on the main deck. For the different departments seven mess-rooms have been provided, each having its own pantry service. The officers' mess-room for the deck officers and engineers is located on the boat deck, one for the junior engineers and another for oilers and watertenders are on the main deck amidships, the petty officers' mess-room is on the shelter deck forward, as are also separate mess-rooms for seamen and firemen, and a mess-room for stewards is on the upper deck forward. A crew's barber shop and a crew's hospital with separate isolation ward, each with its own toilet, are provided on the shelter deck. Passageways are provided forward and aft which permit the crew to go to either end of the ship without passing through any passenger space.

With a total complement of over 1,300 people to provide food for, victualling arrangements are necessarily on a large scale. A total of five separate galleys are provided, three of which are for passengers and two for crew. The main galley, with its connected bakery, sculleries, pantries, etc., is located amidships on the upper deck aft of the main dining-room to which the pantries are directly connected by passages on each side of the engine casing. Separate galley and pantry equipment for special class passengers is provided in the main galley enclosure at its after end and direct access provided to the special class dining-room immediately aft thereof. For third class and steerage passengers there is a separate galley at the extreme after end of the shelter deck. Forward on the shelter deck there are two crew's galleys, one for the American members and a Chinese galley for Asiatics. (See "Galley Equipment" for outft in galleys, etc.) Cold storage rooms with a total capacity of about 20,000 cu.ft. subdivided into nine compartments, are provided for ship's provisions. These rooms are located on the main deck and are arranged for loading through the same hatches as the refrigerated

cargo and also through stowing ports in the vessel's sides, the ports being directly connected by an athwartship passage. Connection between the cold storage rooms and galley spaces is provided by stairs from the passage and by an electrically-operated dumbwaiter. A similar dumbwaiter connects the service pantries on each of the passenger decks with the galley spaces. On the main deck there is a fully quipped modern type laundry with motor-driven appliances for washing and ironing ship's linen. A linen chute with openings on all state room decks is fitted for passing soiled linen to the soiled linen room adjoining the laundry.

All living spaces are heated by electricity or steam, mechanical as well as natural ventilation is provided, as well as running hot and cold fresh and salt water, electric lighting and other modern features. The vessel has a large electric power and lighting plant as well as an emergency plant for these purposes, a large refrigerating plant, electrically-operated watertight door system, radio telegraph system, hydro-electric steering gear, steam windlass, steam and electric capstans, power-operated boat handling appliances, electric winches, etc., thoroughly in keeping with the best and most modern practice.

Also in keeping with the modern features of the ship itself is the propulsive machinery of turbo-electric type with oil-burning water-tube boilers operating with forced draft and superheated steam.

Further descriptions of the above-mentioned features are attached hereto.

Passenger Accommodations

Accommodations for a total of 988 passengers are provided, of which number over 30 per cent are regular first class. The number of state rooms and passengers of each class are as follows:

First Class				State rooms 112	Passengers 214 or 307
Special Class				39	133
Third Class			***	23	170
Steerage		***			378
Totals	•••			174	988

Further particulars of the accommodations are as listed in the sections which follow.

Suites:—There are four de luxe suites located on the bridge deck just aft of the main entrance lobby, two on each side of the vessel, adjoining each other. Each suite contains a private verandah, sitting room, bedroom and bath-room; and for each pair of suites there is a large trunk room directly across the passage, in which lockers are fitted for the occupants of each suite. One suite on each side is modern in design and the other French. The walls of the verandah and the sitting room of each "Suite Moderne" are panelled in padouk (a Burmese wood of the mahogany family) and the bedroom has painted paneling with African mahogany trim. The verandah and sitting room of the "French Suites" are paneled in prima vera and the bedroom has painted paneling in keeping with the general French influence. Each verandah has three large metal-framed sliding windows in the side of the ship which permits them to become practically open-air parlors when desired. Also, the partition between the verandahs and sitting rooms are fitted with large windows which may be opened and thus virtually throw the two rooms into one. In the modern suites these windows are a balanced vertical sliding type and in the French suites they are casement type. Separate entrance doors are provided to the sitting room and bedroom, and in the alcove at the entrance to the bedroom there are two built-in wardrobes fitted with modern conveniences and automatic lights. Each bedroom is furnished with two single beds, two night tables, dressing table, chest of drawers, etc., all in period design. Furniture in the sitting room and verandah is also of attractive period design. Carpets are laid in the bedroom and sitting room, and rubber tile in pattern and colors to harmonize with the design of the suite is laid in the verandahs. Each room of the suite is heated by electric heaters and has mechanical ventilation in addition to bracket fans. In the bedrooms a special light is fitted at the head of each bed, in addition to the ceiling fixtures and those at dressing tables, etc. Special lighting fixtures, electric heaters, radio speakers, special hardware, etc., are provided as described under those headings. The fullytiled bath-rooms of the suites are elsewhere described under Bathrooms and Toilets, and Tiling in Bath-rooms, etc.



Smoking Room, First Class



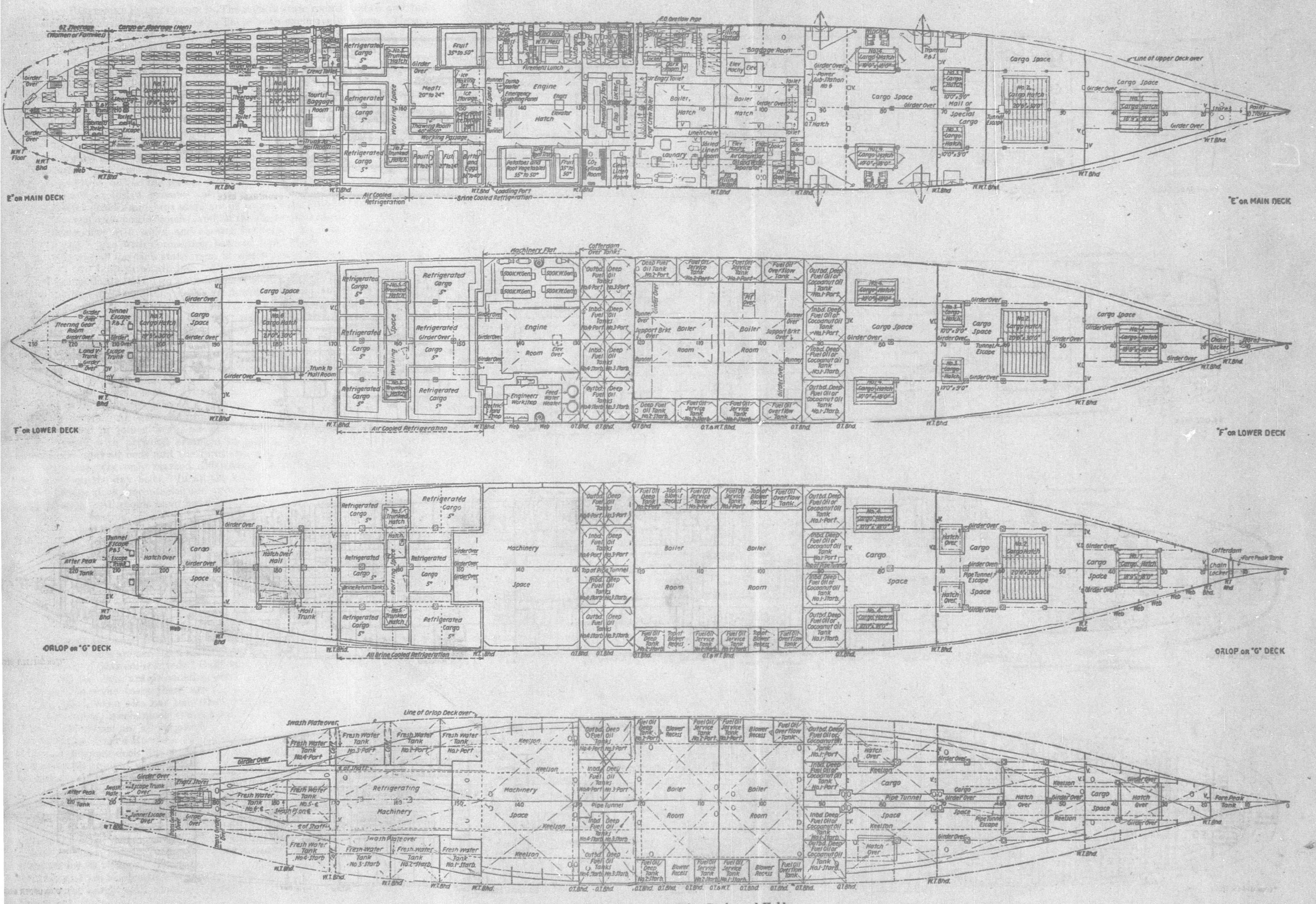
Verandah Cafe



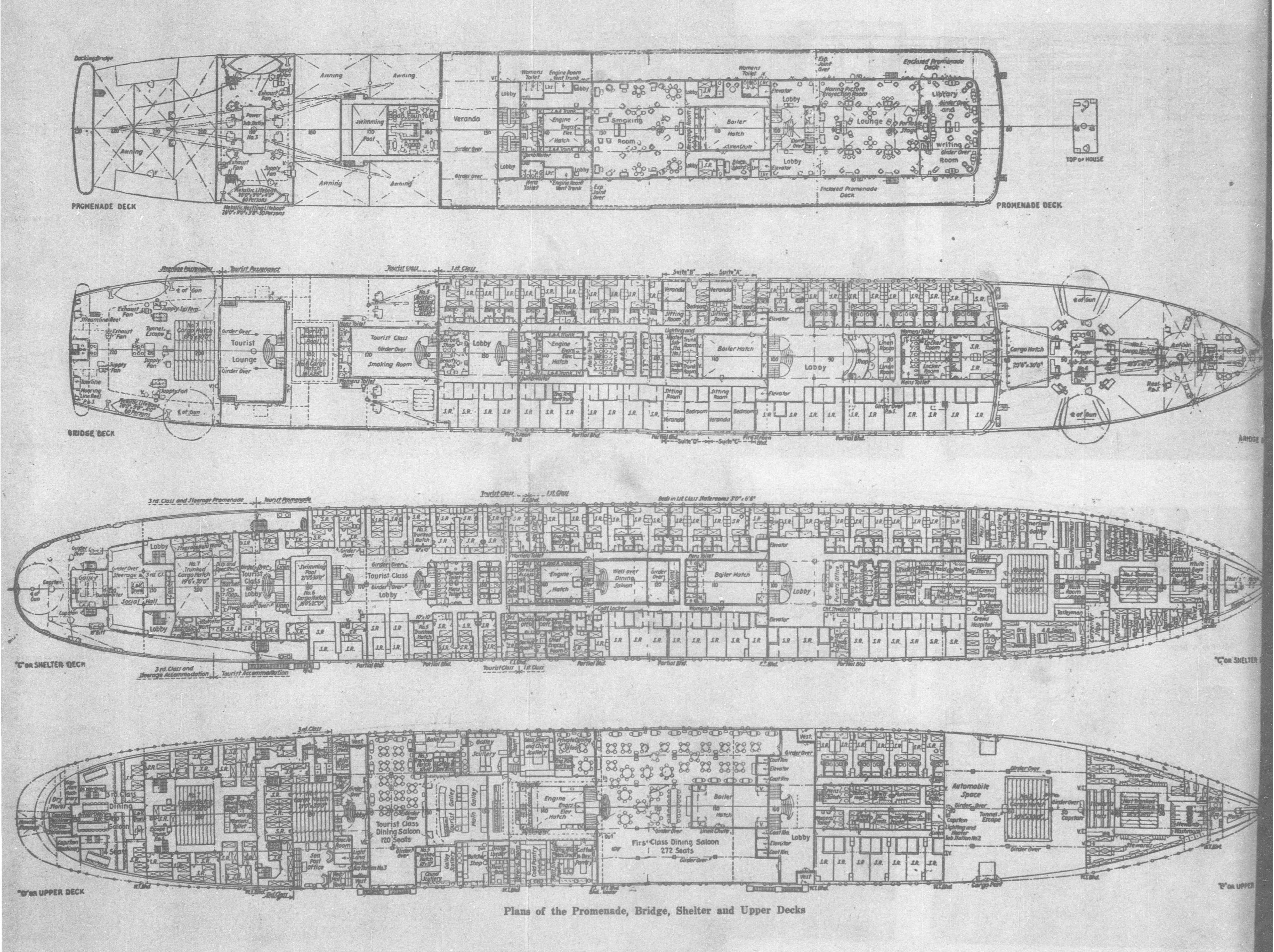
Another view of Smoking Room



Soda Fountain Room



Plans of the Main, Lower and Orlop Decks and Holds



IST CLASS PASSENGER STATE ROOMS:—The regular state rooms may be roughly divided into four types: Those with exclusively private baths; those with a connected bath between two state rooms; one person rooms with toilet and shower; and two person rooms with either private or connected toilet and shower. All state rooms are fitted with single metal framed beds; there are no upper berths in any 1st class rooms. Two rooms on the promenade deck are for one person only; all others have two beds. In all the large rooms there is also a settee or day bed, which may be used for a third person when desired.

Rooms with exclusive private baths, of which there are 39, are located on the upper deck forward of the main entrance lobby, abreast the forward lobby on the shelter deck, and at the forward end of the bridge deck enclosure. There are also three rooms of the same general type, one on the shelter deck and two on the bridge deck, which have exclusive private toilet and shower. On the bridge and shelter decks amidships there are 52 rooms with private bath-room between each pair of rooms, and on the shelter deck there are four other rooms with toilet and shower between. In practically all of the rooms with connecting bath or toilet there is a special dressing alcove for each state room in which are fitted two lavatories and two built-in wardrobes. All state rooms on upper, shelter and bridge decks have two built-in wardrobes, night tables, and a combination dressing table, desk and double chiffonier.

State rooms on the boat deck are all for two persons; they are furnished with two single beds, a chiffonier and at least one and in some cases two built-in wardrobes. These rooms with one exception are connected to a toilet and shower; one of them has a private toilet and shower. A lavatory of the same color as the plumbing fixtures in the toilet, with vitrolite splashboards in way thereof, is fitted in each room.

All regular 1st class rooms have paneled overhead ceilings and paneled walls, the latter painted a light salmon in some cases and cream in others. All steel enclosures for the bath-rooms and toilets are encased in joiner work, all sides of the rooms being uniformly finished with plywood arranged in panels. The floors are all carpeted, and all beds and the furniture in general are the same in all rooms; the only marked difference is in the color of the upholstery on the day beds. In all the rooms at the forward end of the bridge deck, receptacles are provided for plugging in radio connections. All rooms have bed lights, mechanical ventilation and electric heating.

Special Class State Rooms.—The special class state rooms are all located on the shelter deck adjoining the 1st class state rooms In that deck and are so arranged that they may be used for first lass passengers when desired. Of the 39 state rooms in this class, 3 are arranged for three passengers each and the remainder for our. Each state room is fitted with two single beds exactly the ame as those in the regular first class rooms and folding metal ullman berths are fitted over one of the beds in the three-passenger coms and over both beds in the four-passenger rooms. All rooms ave natural light and air through "Utley" type pivoted airports; number of the rooms are arranged in "Bibby" type with alcoves which a chest of drawers is fitted. Built-in wardrobes the same those in the 1st class, are provided in each room; the majority eve two and in some cases there are three of these wardrobes a room. Each room also has two stacks of drawers and toilet tures, bed lights, mechanical ventilation, etc., similar to the st class. The rooms are all carpeted.

Third Class State Rooms.—All these rooms are located at after end of upper deck; the majority of them are arranged to commodate six or eight persons each. All rooms are fitted with stal berths of fixed lower and upper type furnished by The Rome, and a lavatory with running hot and cold water supply. Each om is provided with steam heat and mechanical ventilation and a Asbestolith floor covering.

STEERAGE.—All accommodations for steerage passengers are ated on the main deck aft. At the extreme after end of this ek there are fitted six compartments in which permanent berths provided for 60 persons. The remainder of the steerage berths portable and are located in compartments which are also availe for general cargo. All steerage berths are metal, of the ndee type.

Bath-rooms and Toilets

Among the many special features of the vessel probably none appeal more to the 1st class passengers than the elaborate

bath and toilet facilities which have been provided for their comfort. These are particularly noticeable in the elaborately tiled and equipped private bath-rooms with which the ship abounds. Both in color schemes and fixtures these spaces are as modern and complete as have ever been installed on a ship anywhere and they will stand favorable comparison with those in the finest hotels.

Exclusive of the four suites, each of which has, of course, its own private bath-room, there are 39 state rooms with private bath-rooms. There are also 52 state rooms in which a private bath-room is fitted between each pair of rooms, 26 bath-rooms being thus connected. Besides these there are six state rooms each of which has a private toilet and shower bath, and ten state rooms in which a similar private toilet and shower bath is fitted between each pair of rooms. With only one exception, each first class state room either has a bath-room for the exclusive use of its occupants, or is directly connected to a private bath-room which is for the exclusive use of the occupants of not more than two state-rooms.

In the numerous public baths and toilets throughout the ship all tubs and lavatories are white enameled and the urinals and water closets are white vitreous ware. A large wood bath tub has been installed in the third class accommodations for the use of Japanese passengers.

All bath tubs are fitted with a wall shower with hot and cold salt water to the tubs and hot and cold fresh water to the showers. All separate showers, except in the steerage, and all lavatories throughout have hot and cold fresh water supply.

All plumbing fixtures and most of the accessories were supplied by the Noland Company of Newport News, Va., the greater part of the equipment being of the Standard Sanitary Company's make. Toilet cabinets, towel shelves, towel rods and towel baskets were supplied by the Enameled Iron Products Company.

Passenger Swimming Pools

1st Class Pool.—An outdoor salt water swimming pool for first class passengers is arranged in a special watertight steel trunk built between the promenade and boat decks on top of the special class smoking room deck-house at the after end of the promenade deck. The inside dimensions of the pool are 16-ft. 0-in. by 24-ft. 2-in., and a depth of water of 7-ft. 0-in. is provided.

Forward of the tiled walk, a portion of the boat deck is railed off and covered with sand to form an artificial beach for bathers.

Continuous circulation and renewal of the water of the pool while in use is provided from the salt water pressure system which is supplied by a pump in engine room.

Special class Pool.—An outdoor salt water swimming pool for special class passengers is arranged in cargo hatch No. 6, in a watertight steel trunk extending from shelter deck to bridge deck. The inside dimensions of the trunk are 21-ft. 0-in. by 30-ft. 0-in., and the clear opening of the hatch in the bridge deck is 16-ft. 0-in. by 25-ft. 0-in., with about 7-ft. 0-in. depth of water. Continuous circulation of the water in the pool is provided in the same way as for the first class pool.

Moving Picture and Radio Arrangements

A moving picture projection room entirely enclosed in steel, is provided at the after end of the first class lounge just forward of the lounge lobby and partly under the stairs to the boat deck, for the exhibition of motion pictures in the lounge. In order to raise the projectors above the heads of the audience, the room is fitted with a raised steel floor, about 38-in. above the steel deck and covered with corrugated rubber flooring. An aperture in the steel bulkhead is provided in front of each projector, with a smaller aperture at one side for operators' use. These openings are arranged to be automatically closed in case of fire by sliding steel shutters which are normally suspended by a cotton string and drop into place when the string is burned away. When not in use, these apertures are concealed behind sliding mirrors in the after end of the lounge, which may be raised or lowered, from inside of the projection room, by mechanical operating gear and are arranged to drop into pockets behind the joiner work. Access to the projection room is provided by means of a metal lined wood door in the joiner paneling, and a folding steel step on the outside of the steel enclosure. The room is equipped with two motion picture projectors, photophone with motor generator set; electric phonograph with double turntable; radio motor generator, amplifier, and



Tourist Lobby, "C" Deck



Suite de Luxe Bedroom



Forward Lobby "A" Deck



First Class Dining Saloen

centralized control panel; and a re-winding bench for motion picture films, thus serving the double purpose of a radio reception and transmission room, and a moving picture projection room. Radio equipment furnished by the Radio Corporation of America.

Radio System.—The ship is supplied with an R. C. A. Photophone or talking motion picture outfit of the latest type in the first

class lounge.

An R. C. A. centralized radio system of the latest type is located in the motion picture projection booth just aft of the first class lounge. Provision is made for transmitting radio broadcast reception program or phonograph records to forty loud speakers located in all public spaces including first class, special class and third class. Speakers are also provided in the suites de luxe and receptacles for plugging in loud speakers are provided in twenty of the 1st class state rooms at the forward end of the bridge deck. Speaker outlets are also provided in certain officers' and crew's mess-rooms and quarters. Orchestra music from the main dining saloon balcony can also be broadcast through all speakers, and through microphones located in the chart room and projection room announcements can be made through all speakers covering every space where passengers are assembled, A special speaker is provided on the sun deck for use at swimming pool or on the game deck.

LAUNDRY EQUIPMENT.—In order to cater to the needs of approximately 900 passengers and crew (exclusive of steerage passengers) an exceptionally complete equipment of laundry appliances, equal to that of the average commercial laundry on shore and of

the most modern character, has been installed.

The laundry is conveniently located on the main deck amidship, between the starboard side of the ship and the boiler casing.

The washing machine is of the solid head, two compartment type with monel tub and monel washing cylinder about 36-in. diameter and 64-in. long, and is motor driven. A three compartment stone tub about 72-in. long, 24-in. wide, and 16-in. deep, with running hot and cold fresh water supply, and a 30 gallon soap tank are installed adjacent to the washer. The drying equipment consists of a 28-in. vertical under-driven solid curb extractor and a steam heated super-suction tumbler with a 40-in. by 44-in. drying cylinder, both machines being motor driven. All flatwork is finished on a 75-in. motor driven return apron ironer, and pieces requiring handwork are ironed on a self-contained ironing board with single electric hand iron equipment. The laundry is furnished with work tables and shelves, and the linen rooms are fitted up with shelving so as to provide the maximum storage space. All laundry appliances were furnished by the American Laundry Machinery Company of New York.

In addition to the regular laundry equipment, a Kny-Scheerer Co. steam disinfecting chamber, about 30-in. by 42-in. by 84-in. inside, is installed on the bridge deck aft for use in keeping the

steerage bedding in a sanitary condition.

Life Saving Equipment

LIFE-BOATS

Type.—Metallic, round-bottom, constructed and fully equipped in accordance with U.S. Steamboat Inspection Service Rules for offshore ocean service. All boats, except motorboats, equipped with mast and sail. All boats equipped with Steward releasing gear.

Number, Size, Capacity and Location:

10-32-ft. 6-in. by 10-ft. 6-in. by 4-ft. 6-in., 90 persons each, on boat deck amidships.

4-28-ft 0-in. by 9-ft. 0-in. by 48-ft. 0-in., 60 persons each, 2 on bridge deck aft, 2 on roof of special class lounge deck house.

2-26-ft. 0-in. by 9-ft. 0-in. by 4-ft. 0-in., 50 persons each, rested inside of two of the above 60 person boats on deckhouse roof.

2-26-ft. 0-in. by 7-ft. 3-in. by 3-ft. 2-in., 35 persons each, to be used as work-boats, on boat deck forward.

2-28-ft. 0-in. by 9-ft. 0-in. by 3-ft. 8-in., 45 persons each, motorboats, fitted with Z. R. 18 h. p. Palmer motor with hand starter, on boat deck forward.

DAVITS.—10—sets of Welin-Maclachlan gravity davits for handling the 10 90-person lifeboats on boat deck. Each set of davits is provided with an electric winch, hand and motor controlled capable of hoisting an empty 90-person boat up the ship's side at

a speed of 14-ft. per minute, with 7-in. dia. non-spinning steel wire rope falls. The forward winch on each side has its own separate motor and the other winches are located in pairs with motor between, operating each winch independently through a clutch. Motors for winches on Hull 339 are General Electric Co. make and on Hull 340 they are Westinghouse; all motors enclosed watertight, 13½ h.p. at 875 r.p.m., d.c., 230 volts. Double channel trackway for each davit is carried down to promenade deck at side and attached at inboard end to top of boat deck house. Davits furnished by makers complete with winches, motors, trackways, gripe gear and steel lead blocks for boat falls.

8—sets of Welin quadrant davits for handling the two 28-ft 0-in. motor life-boats, four 28-ft. 0-in. regular life-boats (two of these have 26-ft. 0-in. nested life-boats) and two 26-ft. 0-in. life-boats used as work-boats. Each davit furnished by makers complete with cruciform bollard, fairlead and reel for boat falls of 3½-in. Manila rope with 12-in. triple steel blocks, close-hauling type;

lower block of non-twisting and non-toppling type.

2-Hyde electric boat winches are installed on navigating bridge deck forward for handling the two motor life-boats and the two work-boats. Each winch has two gypsy heads, each capable of raising 2,500 lbs. at a speed of 100-ft. per minute. Winch motors are 25 h.p. at 550 r.p.m., d.c., 230 volts, with magnetie brake. Motors for H-339 are General Electric make, and for H-340 they are Westinghouse.

The (4) regular 60-person life-boats on the bridge deck aft and on the special class lounge deck-house roof, and the (2) 50person nested boats, are arranged to be handled by the cargo winches aft of the mainmast, and the boat falls will be led through

snatch blocks to the gypsy heads on these winches.

All life-boats and davits were furnished by the Welin Davit

and Boat Corporation.

LIGHTING.—In addition to the usual emergency lighting arrangements at the boat deck by means of a special lighting circuit supplied with current by an emergency generator and storage batteries as required by law, additional high wattage, rugged, watertight lights are provided on this emergency circuit, located under the overhang of the promenade deck so as to throw their light downward over the sides of the vessel to facilitate the launching of the life-boats in case of disaster at night.

Mechanical Equipment

MAIN PROPELLING MACHINERY

The main propelling machinery is of the well known steam turbine electric drive type arranged for driving twin screws. Each propeller is driven by a motor rated at 13,250 s.h.p. at 133 propeller r.p.m. The complete electric propulsion equipment was supplied by the General Electric Company and is described below.

ELECTRIC PROPULSION EQUIPMENT

The electric propulsion equipment consists of the following: TWO MAIN TURBINE-GENERATOR SETS

Turbine rating: 10,100 k.w., 2,660 r.p.m., 16 stages.

Generator rating 10,100 kw., 2,660 r.p.m., 4,800 volts, three phase.

Steam conditions at throttle valve: 275 lb. gauge, 200 deg. F. superheat.

Vacuum: 28.5-in. in turbine exhaust casing.

Two Main Propulsion Motors

Synchronous-induction type: rated maximum continuous, 10,100 kw. 133 r.p.m., 4,800 volts, three phase.

Two Propulsion Motor Ventilating Fans

Motor rating C.D.M.-125, 22/40 h.p., 600/740 r.p.m., 230 volts.

TWO SURFACE AIR COOLERS FOR GENERATORS

One surface air cooler for each main generator, consists of two sections each rated 2,600 sq. ft. of cooling surface 2-pass, 150 tubes.

ONE CONTROL PANEL WITH TWO CONTROL GROUPS, EACH GROUP CONSISTING OF HIGH-VOLTAGE AND LOW-VOLTAGE CONTACTORS The panel contains necessary electrical instruments, field-

rheostat-adjusting hand wheels, electric speed indicators for motors and turbines, and the main operating levers.

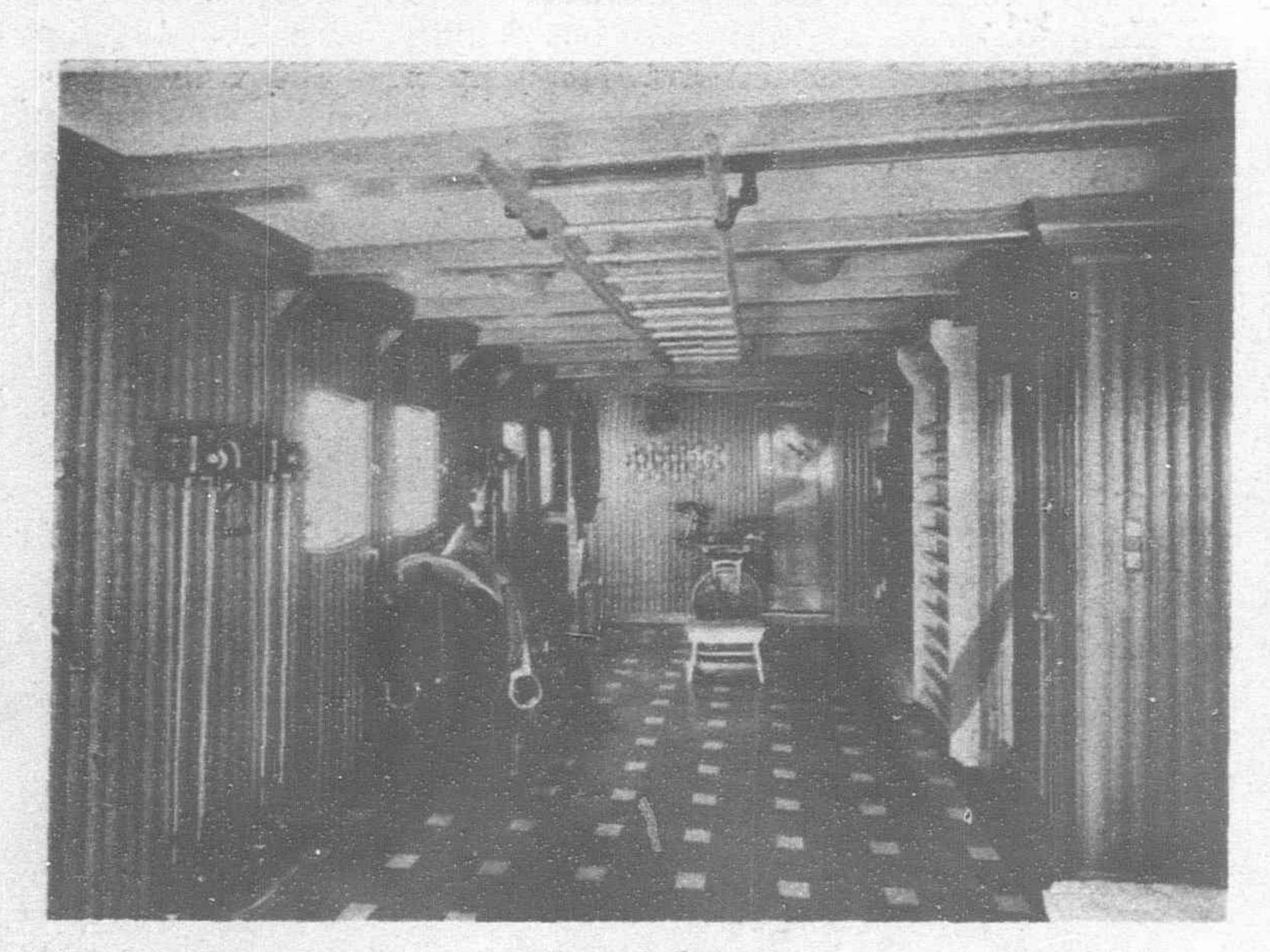
Power for propelling the ship is developed in two steam turbines, each direct-connected to an alternating-current electric generator. The two generators supply current to two propulsion



Corner of the Music Room

motors which are each direct-connected to a propeller. Current from the generators to the propulsion motors is controlled by means of various control apparatus mounted on a control panel.

The main turbines are of the downward exhaust type and mounted directly above their respective condensers. The steam conditions at the main throttle valve are 275 lbs. gauge and 200 deg. F. superheat and the vacuum at turbine exhaust 28.5 inches. The primary consideration in the design of the turbines was that of ruggedness. The rotors are milled out of a solid steel forging and all wheels except the first are integral with the shaft. There are sixteen wheels all of which contain one row of blading, except the first which has two. The blading is of exceptionally heavy construction and the critical speed of the completed rotors is well above the highest running speed. The high pressure head is of cast



Gymnasium

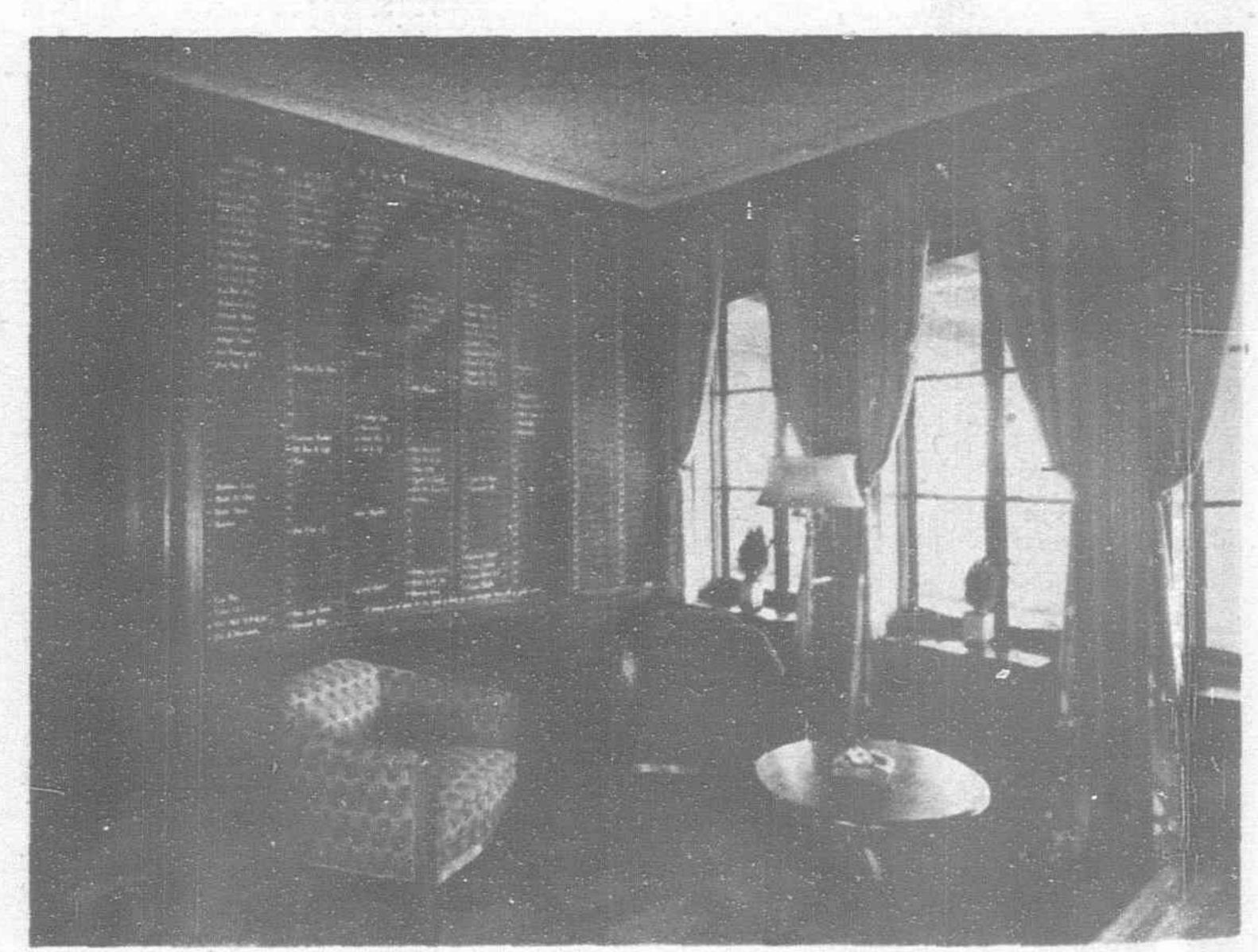


Doorway connecting Lounge and Library

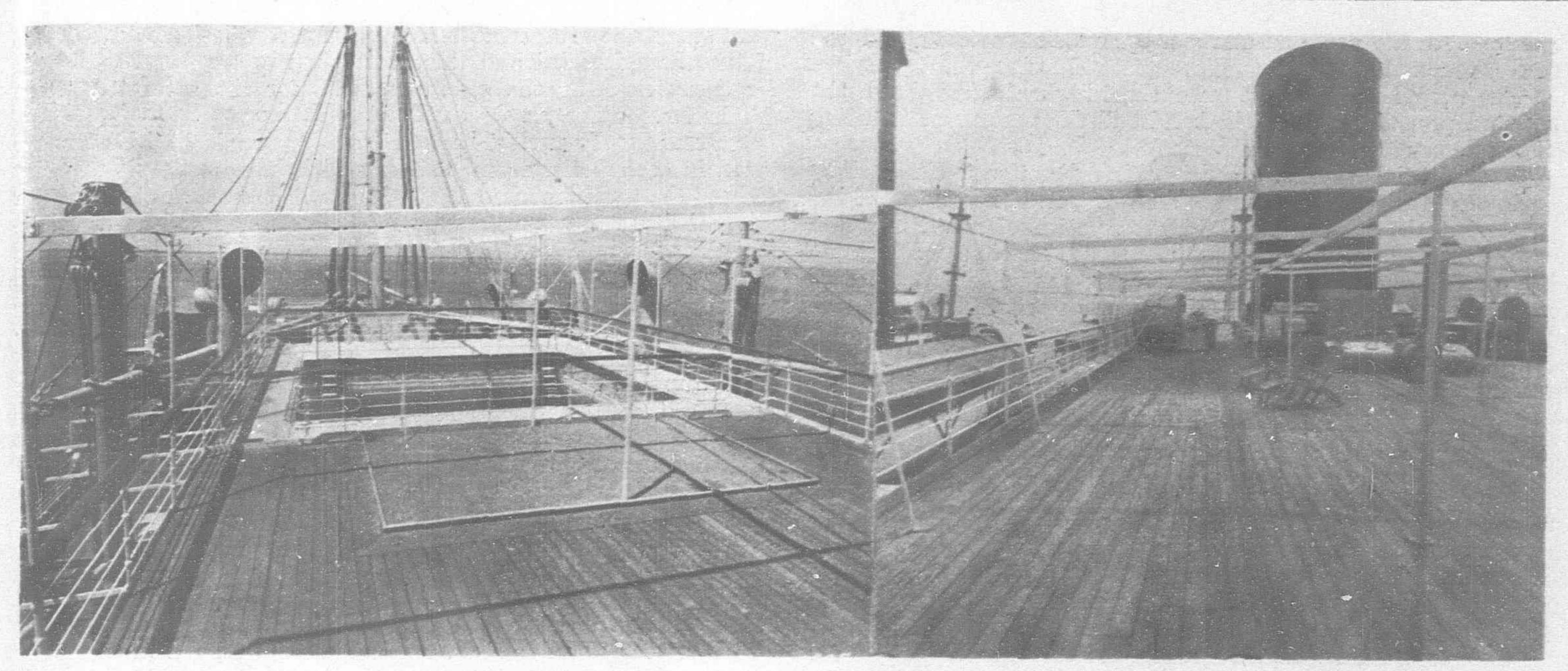
steel construction and the upper halves of both the high and low pressure casings are hinged so as to permit ease in inspection.

Control of the steam flow is by means of the main throttle valve, and, three subsidiary hand valves which permit minor steam flow adjustment without the necessity for throttling the pressure. The main throttle valve is remotely controlled from the main operating panel by means of a lever which actuates a hydraulic, oil operated mechanism. The hydraulic mechanism is inter-connected with the lubrication system and an over speed tripping device which cuts off the steam supply automatically in case of overspeed or cessation of oil supply.

The turbine may be controlled either for constant speed or for constant steam flow as desired. In the latter case the speed governor is set to function at a few revolutions above that obtained



Where Stocks are Quoted



First Class Swimming Pool Equipped with a Sand Beach and Sun Deck

through the steam flow setting as regulated by the hand valves. In this manner it is possible to operate at full power even in rough weather, without danger of the propeller racing in case it should emerge from the water. The combined system of steam flow and speed control also permits of the equipment being operated under conditions of widely varying torque with minimum throttling loss.

The turbine operates in but one direction of rotation and has but two steam sealing glands, one at each end of the turbine. There are two extraction openings for bleeding steam for feed water heating. The high pressure opening provides steam at 65 lbs. gauge pressure thus permitting of the attainment of 300 deg. F. feed water temperature. The low pressure opening provides steam for the low pressure feed water heater at slightly above atmospheric pressure.

As the turbine generators are electrically disconnected during warming up, this process is greatly simplified. They may be allowed to idle at slow speeds under their own steam with the certainty that there is proper heat distribution. A hand turning device is provided for use when taking clearances, examining shaft bearings, etc., but it is not otherwise used.

The main generators which are directly connected to the turbine shafts are of the totally enclosed, internally ventilated type, and provided with external air coolers. Complete assurance against deposits of oil or dust on the windings is thus assured and therefore, long life of the insulation. The fan which circulates the air through the windings and thence through the air cooler is situated on the end of the rotor shaft. The tubes in the air cooler are supplied by circulating water from the main circulating pump discharge.

The generator is of the two pole type.

The rotor is a solid steel forging and has slots milled in its face in which the field windings are imbedded. The stator frame is of built up steel plate construction. The core is made up of laminated plates in which slots are provided for the reception of the windings.

Electric heating coils are located inside of the inner shields for the prevention of moisture accumulation on the windings during periods when the generator is idle. The temperature is kept at just slightly above room temperatures (2 to 4 deg. F.) in order to prevent condensation.

Fire extinguishers are also provided. Temperature coils are imbedded in the stator windings and a testing device situated on the operating panel for determining the temperature of the armature windings at any time desired. The generator field temperature

is constantly visible on a meter situated on the operating panel. This temperature is based on a measurement of the field voltage and current and the known resistance of the windings.

The main propelling motors are of the highly efficient synchronous-induction type operating at unity power factor. The stator frames are of built up steel plate construction, and the rotor spiders of cast steel. Like the generators they are supplied with stator temperature detectors and heating coils for the prevention of condensation on the windings during idle periods.

The induction motor windings which are of the squirrel cage type and used only when starting, are imbedded in the pole faces of the field cores and short circuited by

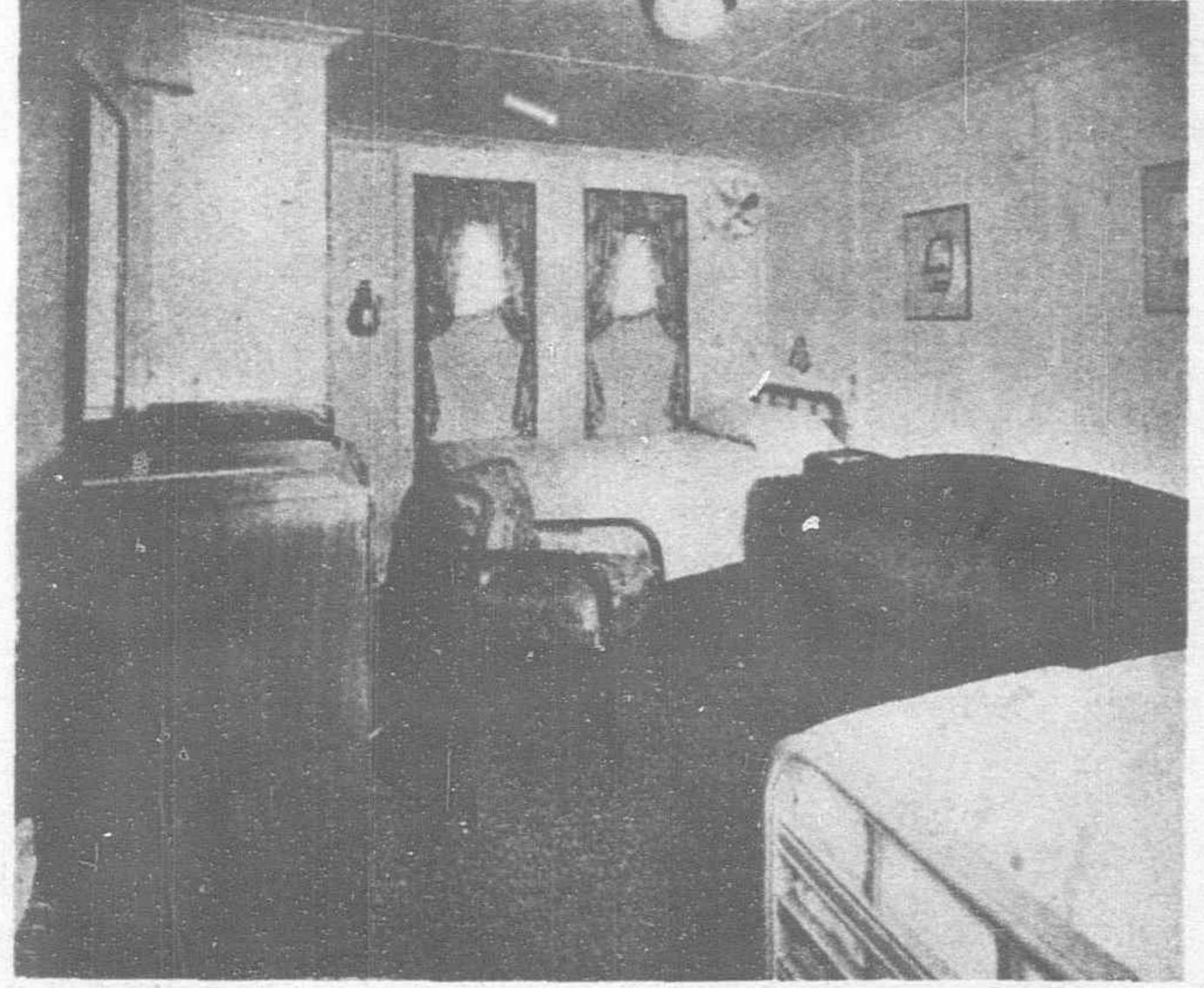
means of end rings to which the copper bars are welded.

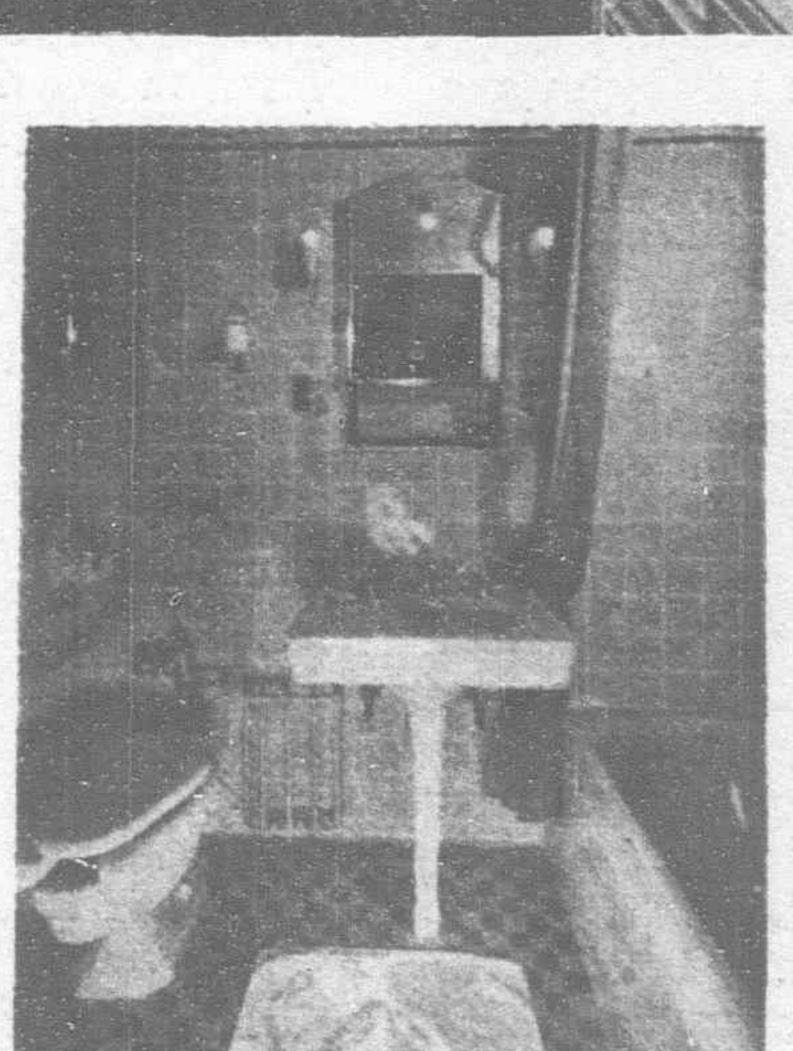
The control panel has mounted on its face the various levers for maneuvering the ship, the rheostat control wheels for adjustment of the generator and motor fields and the instruments for measurement of power. In the upper center of the panel are situated the steam and vacuum gauges and the clock.

Cross tie busses with switches are provided which permit of the parallel operation of the two propelling motors from either main generator.

Under this condition of operation, the turbine generator not in use, is shut down with its attendant condenser and auxiliary equipment.

The equipment is arranged so that one main turbine-generator furnishes power for driving the port propulsion motor, and the second main turbine-generator furnishes power for driving the starboard propulsion motor. Also, provision is made to allow either main turbine-generator





First Class State Room and Bath-room

to drive both the port and starboard propulsion motors at reduced speed (approx. 104 r.p.m.).

The propulsion motors turn outboard when going ahead, the starboard propeller being right hand and the port propeller being

left hand.

Variation in propeller speed in either direction is obtained by varying the turbine speed, and is directly under the control of the operator at the control panel. The direction of rotation of the propeller is reversed by changing the relationship of two of the three phases leading to the motors; this is accomplished by means of contactors operated by levers located at the control panel. The turbine-generators always rotate in the same direction but, with both in operation, the speed of either propeller may be varied or reversed irrespective of the other. When one turbine generator is used for driving both propulsion motors, both motors operate at the same speed; this is true even though both motors are not rotating in the same direction.

When starting, the turbine-generators operate at approximately one-quarter speed, and the propulsion motors are brought to approximately one-quarter speed operating as induction motors. The field windings of the generators are temporarily over-excited to bring the motors fully into synchronism, after which normal

excitation is used.

Two separate motor-driven blowers furnish ventilation for the main propulsion motors (one blower for each propulsion motor). The blowers for ventilating the main generators are built into the generator rotors.

A supply of direct current for excitation of the main generators and propulsion motors is provided by any one of the four 500 kw., d.c., geared-turbine generator sets. These sets also furnish power for driving the various auxiliary motors about the ship.

CONTROL EQUIPMENT.—The main control panel with levers,

handwheels, instruments, etc., is shown in photograph.

The reversing levers on front of the control board reverse one phase when going astern. The governor levers adjust the speed of the main turbines to obtain desired propeller speed which is one twentieth of the turbine speed. In addition to the regular governor levers there are two emergency speed control levers, mechanically connected to the turbine governors in case of failure of the main levers.

By means of the field levers excitation is applied to the generators and motors, the first point of the lever applying excess excitation to the generator for pulling the motor in step as an induction motor, the second point applying field to the synchronous motor with excess excitation remaining on the generator and the third point reducing the generator excitation to normal leaving excitation on the motor fields.

All the above levers are completely interlocked to avoid improper operation and to avoid operating the high voltage contactors with field on even though these contactors are capable of such

operation.

On this control board are provided handwheels for controlling generator and motor field rheostats, switches for measuring on the temperature indicator the temperature of the generator and motor stators at three different points around periphery and switches and rheostats for controlling the main motor ventilation fans.

There is provided a complete outfit of instruments by means of which the operator can visualize the behavior of the various machinery and know exactly how it is performing. By means of these instruments and meters the amount of power is indicated for any condition of running or maneuvering and the power is also recorded for any trip or part of a trip. In fact practically all the information needed by the engineer in charge is afforded by this outfit of instruments and other indicators located near the control board. Consequently the engineer in charge can operate practically

all the propulsion machinery at this location.

Main Boiler Plant.—This consists of twelve of the well known Babcock and Wilcox standard marine type boilers, arranged three abreast in two fire rooms with the drums athwartship. The boilers are built for a working pressure of 300 lb. per sq. in. and 200° superheat. The total water heating surface is about 57,600 sq. ft. and the total superheating surface about 5,700 sq. ft. Each boiler is fitted with four Babcock and Wilcox Cuyama burners for burning oil fuel under cold forced draft. The boilers are especially insulated for the conservation of heat. They are fitted with Babcock and Wilcox automatic feed regulators and Diamond soot blowers. The uptakes from all twelve boilers connect to the for-

ward stack, the after stack being used for ventilation. The drums of the three forward and three after boilers are fitted with coils for desuperheating the steam required for the saturated steam auxiliaries.

FUEL OIL PLANT.—Three Griscom-Russell fuel oil heaters are fitted in each boiler room, two of which have sufficient capacity to heat the total amount of oil which will be burned at full power in one boiler room. There is one Quimby horizontal motor driven fuel oil pump in each fire room capable of supplying the oil burned at full power in one fire room. Two Warren steam driven vertical simplex pumps are supplied as stand-bys. Air is delivered to the burner fronts through ducts on the open fire room system by four

Sturtevant motor driven "Silent-vane" fans.

FEED HEATING SYSTEM.—The condensate is drawn from the main condensers by the condensate pump which discharges through the air ejector condensers to the feed tank. All the latent heat of ejector steam is thus conserved, no raw water pass being fitted. There are two Warren three stage centrifugal main feed pumps each driven by a Terry turbine. Each main feed pump has sufficient capacity to supply all the boilers at full power. There are also three Warren independent steam driven vertical simplex auxiliary feed pumps, one in the engine room and one in each fire room. The feed pumps draw from the feed tank and discharge through two Davis Engineering Company's heaters arranged in series and having sufficient capacity to heat the feed water to 300 degrees F. The first stage heater utilizes the exhaust from the steam driven non-condensing auxiliaries, augmented by steam bled from the eight stage of the main turbines. Steam for the second stage heater is bled from the third stage of the main turbines.

Main Condensing Plant.—Each main generator turbine is served by a 14,000 sq. ft. two pass surface condenser located immediately below the turbine. The condensers are supported on flexible beams so designed as to insure protection for the turbines from undue stresses due to the weight or vertical expansion of the condensers. Circulating water is supplied to each condenser by two motor driven Warren single stage contrifugal pumps each having a capacity of 10,000 G. P. M. Each condenser is served by two two-stage sets of Westinghouse air ejectors mounted on a combined inter-and-after condenser. Each ejector set has sufficient capacity to remove the air from the condenser which it serves when the propelling machinery is developing full power, the other set being used for a spare or in case of abnormal air leakage.

Three Warren 250 G. P. M. motor driven centrifugal main condensate pumps are fitted, one pump serving each condenser and the third pump being used as a stand-by. The duplication of the main circulating pumps and air ejectors, and the spare condensate pump, reduce to a minimum the liability of failure of the condensing plant.

AUXILIABY CONDENSING PLANT.—The auxiliary condensing plant is in general similar to the main plant. In order to insure uninterrupted service for the auxiliary generators, which are of course vital to the operation of the main machinery, two condensers are provided, one serving the forward pair and one the after pair of the 500 kw. generator turbines. One 3,600 G. P. M. Warren single stage centrifugal motor driven circulating pump serves each condenser. Twin Westinghouse air ejectors with inter-and-after condensers are fitted, similar to the main plant. Three 50 G. P. M. Warren motor driven centrifugal condensate pumps are fitted, one to serve each condenser, the third being a stand-by.

All of the motors for the above auxiliaries, as well as practically all of those throughout the ship are of General Electric

Company make.

Properliers.—The propellers are of the built up type 18-ft. 6-in. in diameter, each having three manganese bronze blades and a semi steel hub. The blade sections are of the standard ogival shape.

Main Thrust Bearings.—The propeller thrust is absorbed by independent Kingsbury bearings of the two shoe type, located aft of the main motors. Oil circulating from the main lubrication system is provided.

The characteristics of the main and auxiliary machinery for the vessel follow:

PROPELLING MACHINERY:

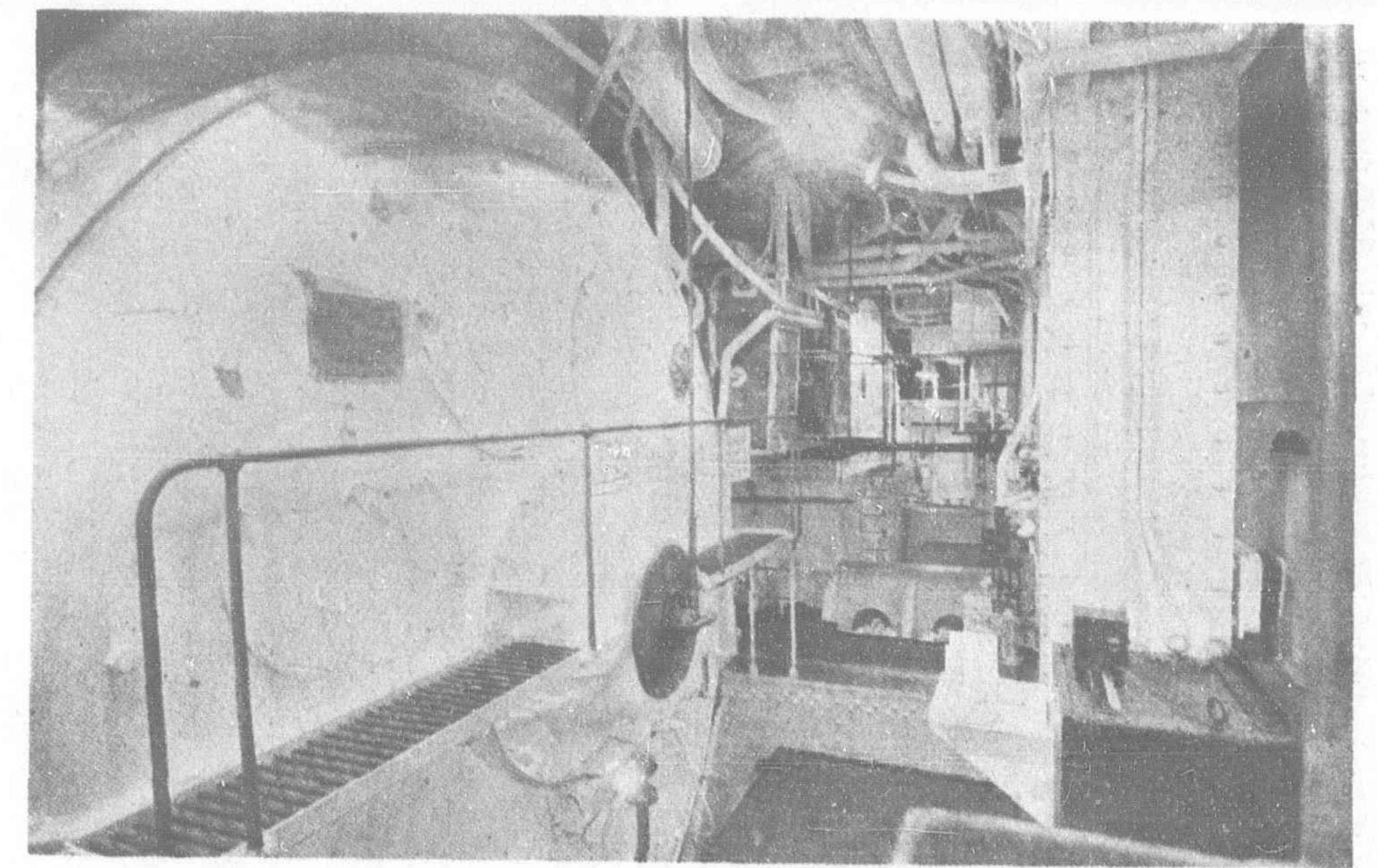
Name of Unit

No. of Description and Characteristics
Units

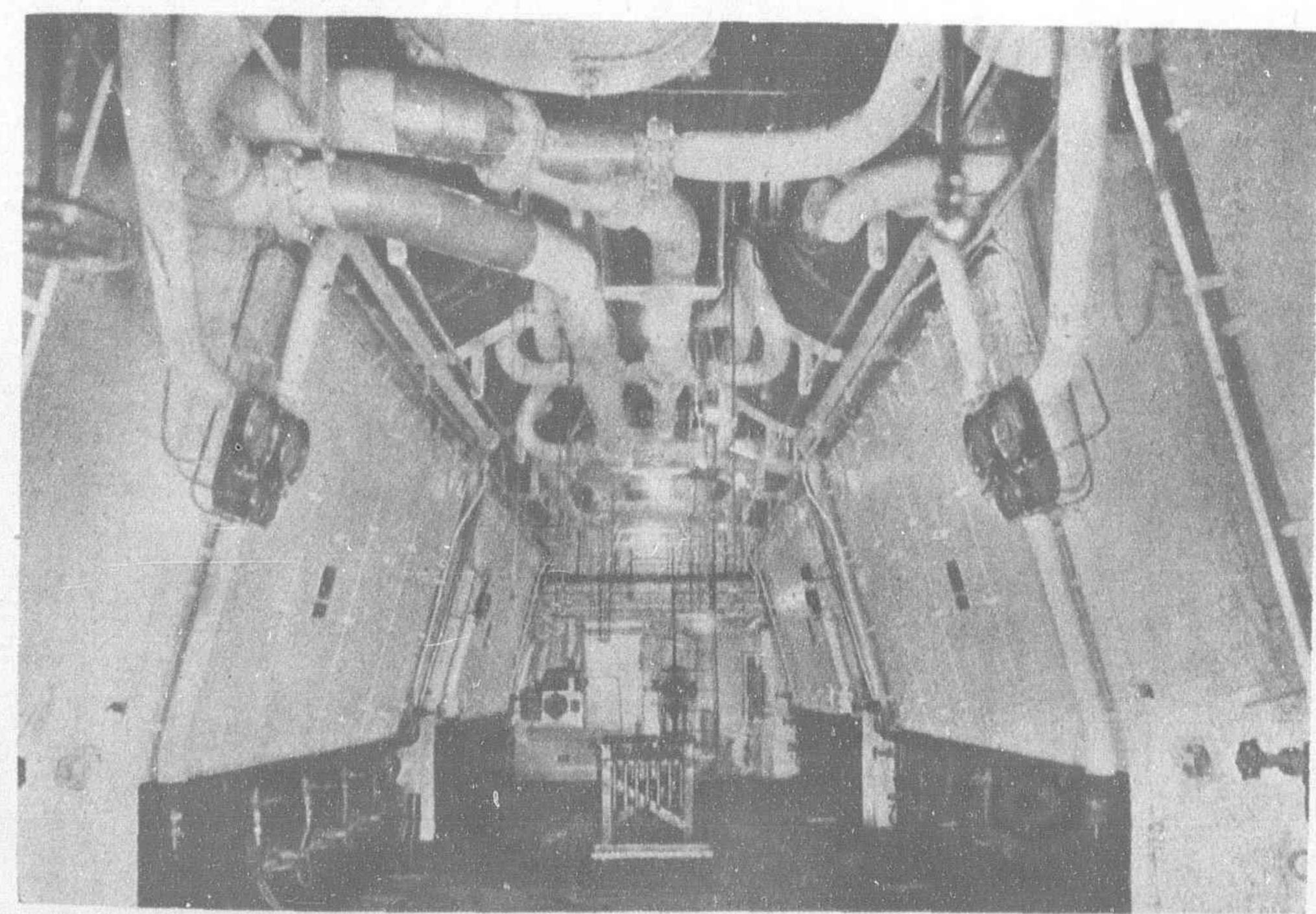
Main Turbines

2 G.E. rated 13,250 shp at 2,660 rpm. Stm. 275 lbs. G., 200°F. superheat, 28.5" vacuum.

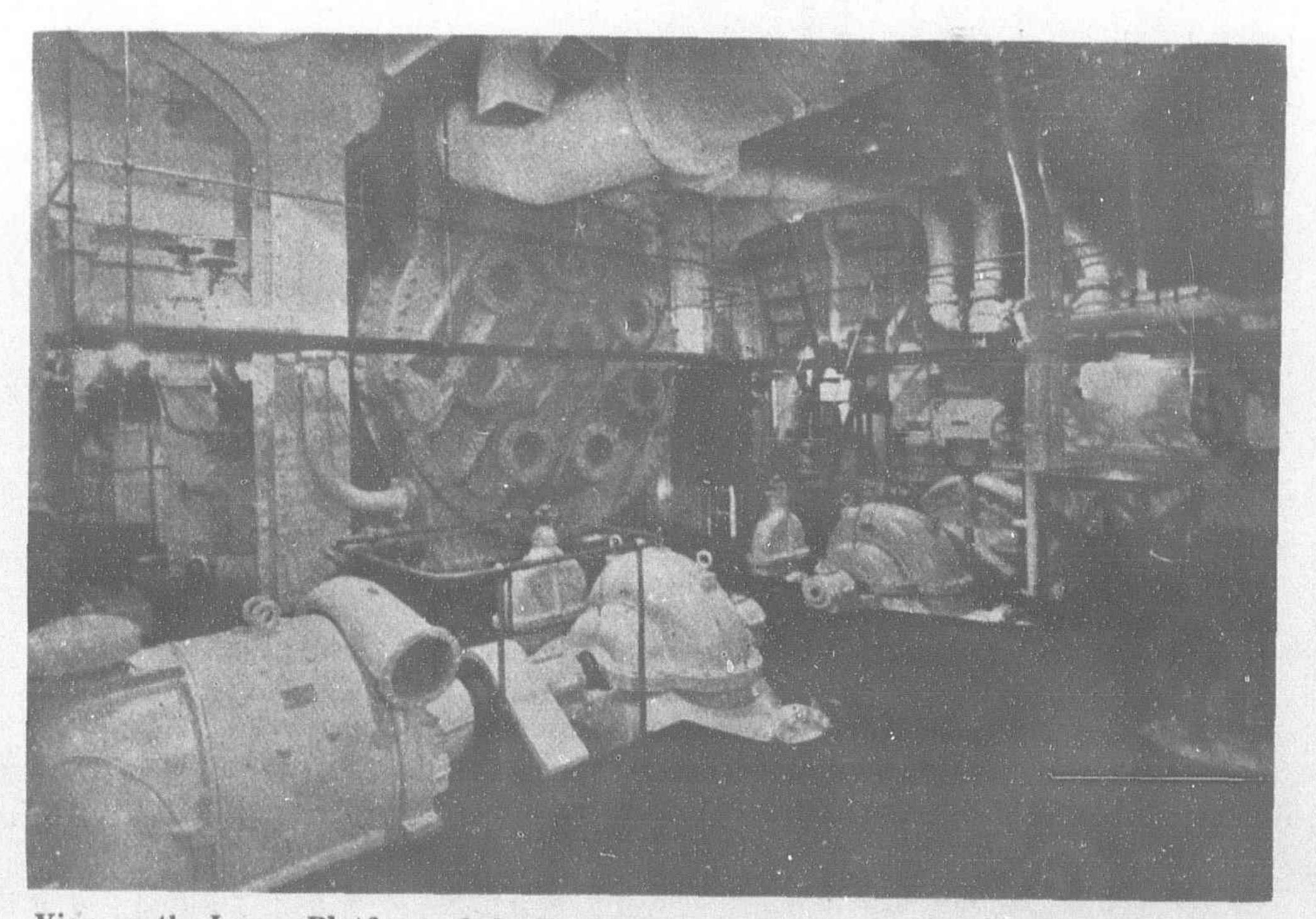




Upper Platform, showing two General Electric Turbo-Generators and Control Stand. Lower Platform, looking across forward end of Propulsion Motors, 26,500 shaft
Horsepower on two Screws



One of the Fire Rooms of the "President Hoover" featuring four of the twelve Babcock & Wilson Water-Tube Boilers. Note neat and workman-like Installation of Steam Piping. Fuel Oil for these Boilers is measured by Empire Oil Meters. High Pressure steam Pipes are covered with 85 per cent Magnesia and with Johns-Mauville Super-ex. Johns-Manville improved "Asbestocel" is largely used for Low Pressure Steam Pipe Insulation and for Insulating Partitions and Bulk-heads



View on the Lower Platform of the Engine Room featuring one of the Main Condensers with its two General-Electric Motor driven Warren Centrifugal Circulating Pumps

Generators

Windlass

Cargo Winches

Boat Winches

Automobile Capstans

Capstans

Elevators

Dumb Waiters

Balancer Sets

Propulsion Generators
Propulsion Motors
Propeller
Thrust Bearings Lubricating Oil Coolers
Turning Gears
Generator Air Coolers Generator Air Cooling Fan Motor Ventilation Fans

Superheaters Desuperheaters F. O. Burners F. O. Heaters Forced Draft Blowers

Main Boilers

Feed Water Heaters Feed and Filter Tank Feed Water Filter

Soot Blowers Feed Water Regulators

Main Condensers Auxiliary Condensers Air Ejectors Main Cond.

Air Ejectors Aux. Cond.

Inter and After Cond. Main Air Ejectors Inter and After Cond. Aux. Air Ejectors

Main Circulating Aux. Circulating Main Condensate Aux. Condensate Main Feed Aux. Feed, Engine Room Aux. Feed, Boiler Room F.O. Service

F.O. Service F.O. Transfer L.O. Service Fire and General Service Bilge, Engine Room Bilge, Boiler Room Ballast

Fresh Water-Culinary Hot Fresh Water Ice Water Circ.

Evaporator Feed Aux. Gen. Oil Coolers Circ. Sanitary and Fire Refrigerating Brine Circ.

Refrigerating Cond. Circ. (CO₂)

Brine Circ. (small)

Sediment Lubricating Oil Cooler Circ. Water Generator Air Cooler Circ. Water Sewage Pumps

2 G.E. 3-phase, A.C., 2 poles, 4,800 volts, attached ventilating fan and air cooler. 2 G.E. 3-phase, A.C. synchronous induction,

40 poles, 13,250 shp at 133 rpm. 2 3 blade 18'-6" dia. built up hub, semi-steel; blades manganese bronze.

Kingsbury two shoe, oil circulation. Each 200 GPM. supplied with 400 GPM. cooling water at 85°F.

2 Double reduction worm and gear; 2 G.E. 10 hp motors. 2 G.E., supplied with 800 GPM water at 85°F.

2 Attached to main generators. 2 G.E. 230 volts, d.c., motor driven exhaust fans.

BOILER PLANT:

12 B and W 57,624 sq. ft. H.S. total 300 lb. G oil, forced draft. 12 B and W interdeck 5,700 sq. ft. H.S. 200°F. superheat. 6 Steel pipe coils in water drums.

B and W "Cuyama," 4 per boiler. Griscom-Russell, each 5,825 lb. per hour, 12° Be. F. O. per hour from 100°F. to 300°F.

4 Sturtevant No. 90 Silentvane, double inlet, double width, 30,000 CFM, G.E. motor, 20 hp. 2 Davis Engineering Co., 1-1st stage, 1-2nd

stage in series, 300°F. final temperature. $16'-3'' \times 8'-3''$ inside. 2 compartments, Loofa viltration.

1 7" Griscom-Russell multi-screen filter; maximum 300,000 lb. Feed water per hour, 425 lb. per sq. in.

Diamond—6 units per boiler.

B and W automatic.

VACUUM EQUIPMENT:

2 Newport News, 2-pass, 14,000 sq. ft. C.S. Newport News, 2-pass, 2,800 sq. ft. C.S. Westinghouse, 2-stage, inter-and-after condenser. 4 Westinghouse, 2-stage, inter-and-after condenser.

2 One for two ejector units

2 One for two ejector units.

PUMPS:

4 Warren, 1 stage centrifugal, 10,000 GPM, 25-ft. head; G.E. motors, 115 hp. 2 Warren, 1 stage, centrifugal, 2,600 GPM, 25-ft. head; G.E. motors, 20 hp. 3 Warren, 2 stage, centrifugal, 250 GPM,

60-ft. head; G.E. motors, 15 hp. 3 Warren, 1 stage, centrifugal, 50 GPM, 60-ft. head; G.F. Motors, 5 hp.

2 Warren, 5" 3 stage, centrifugal, 700 GPM, Terry steam turbine.

Warren, V.S. 14" × 8" × 24". Warren, V.S. 14" × 8" × 18".

Quimby, Horizontal, Gear-in-head, 27 GPM, G.E. motors, 11 hp.

Warren, V.S. 8" × 5" × 12". Warren, V.S. 12" × 14" × 18". Warren, V.S. 12" × 12" × 24". Warren, V.S. 12" × 8" × 24". Warren, V.S. 12" × 12" × 24". Warren, V.S. 12" × 14" × 18". Warren, 1 stage, centrifugal, 800 GPM, G.E. motors, 25 hp. Warren, V.S. 6" × 6" × 12".

Warren, V.S. $4\frac{1}{2}$ " \times 5" \times 6". Warren, 1 stage, centrifugal, 15 GPM, G.F.. motor, 1.5 hp.

Warren, H.D. $7\frac{1}{2}'' \times 6'' \times 10''$. From auxiliary circulating pump.

2 Warren, 1 stage, centrifugal, 400 GPM. 3 Warren, I stage, centrifugal, 300 GPM, 3 G.E. motors, 16 hp.

Warren, 1 stage, centrifugal, 640 GPM, G.E. motors, 10 hp.

Warren, 1 stage, centrifugal, 25 GPM, G.E. motor, 7.5 hp.

Warren, V.S. 6" × 6" × 12".

Supplied from Main Circulating Pump.

Supplied from Main Circulating Pump. Yeomans No. 4 vertical each 250 GPM, 2 G.E. motors, 7.5 hp.

AUXILIARY GENERATORS:

4 G.E. 500 kw., 240 volts d.e., compound wound, geared turbine, 260 lb. G., 190 deg. superheat, 27"—28" vacuum.

2 G.E., 120/240 volts, compound wound, 300 amps. unbalanced current continuously. 2 15 kw., 3 wire, 120/240 volts, compound

Emergency Generator Sets wound, gasoline driven.

EVAPORATING PLANT:

Evaporators 3 Each 50 tons per 24 hours. Distillers Each 10,000 gallons per 24 hours.

Refrigerating Plant:

Brunswick-Kroeschell, 3-cylinder; 4 G.E. Compressors—CO motors, each 100 hp.

Condensers—CO Brunswick-Kroeschell, each 3,500 linear ft. seamless drawn copper tubing. Brine Coolers or CO.

Evaporators Brunswick-Kroeschell, each 3,000 linear ft. extra heavy steel tubing. Cargo Cooling Fans

9 4-2,450 CFM No. 2 Sirocco; 2-2,000 CFM No. 2 Sirocco; 2-3,250 CFM No. 21 Sirocco; 1-2,870 CFM No. 21 Sirocco.

DECK AUXILIARIES:

Steering Gear American Engineering Co. Hydro-electric 4-cylinder, 2 pump sets, 2 G.E. motors 75 hp.

Navigating Equipment 1-Cyro pilot equipment complete, 1-Spercy gyro-compass complete, 1-rudder angle indicator equipment, 1-radio compass (direction finder).

> American Engineering Co. horizontal spurgeared; 14" × 14" horizontal double cylinder steam engine; 3\frac{1}{2}" chain.

18-single geared, single drum; G.E. motors, 35 hp; 4 double gear, single drum; G.E. motors, 25 hp; 2-single drum, compound geared, G.E. motors, 35 hp.

14 2-15" heads, worm gear drive; 2 G.E. motors, 25 hp; 12-Welin MacLachlan davits. 4 1—Steam driven 25,000 lbs., 3 motor driven,

25,000 lbs., G.E. 75 hp. motors. 2 18" head worm gear drive; G.E. motors, 15 hp.

3 Electric, 2 passenger, lift 1,800 lbs. 1-Engineers' lift, 1,000 lbs. 2 Electric lift, 100 lbs.

Bethlehem 7" diameter, 6'-6" high, 75 tons

2-16" dial pedestal type transmittor, 2-21"

lean mixture per hour; 45 tons rich

dial indicators; 1-16"dial transmitter;

2-21" dial indicators; 1-12" tran-

smittor, docking and steering; 1-12"

steering transmittor; 1-12" docking

1-L.O. Purifier, G.E. motor; 1-vertical

1—8 station Henschel, navigating use; 1—19

1—Lux fire extinguishing system for boiler

station Holtzer-Cabot, ship's officers use.

heater, 100 gallons per hour.

30,000 CFM Fans

mixture per hour.

transmittor.

Engine Room Ventilation MISCELLANEOUS:

Air Compressors Ingersoll-Rand 14" × 12"; 1 stage, belt drive, 1 G.E. motor, 85 hp.

Oil and Water Separators

Mechanical Telegraphs

L.O. Purifier-L.O. Heater

Interior Communication Telephones

Fire Extinguishing Equipment

Pneumercator Watertight Door Equipment

Fire Alarm System

Work Shop Tools

17 15—sets electric Dean "A", 2—230 volt units; 2 hand control units.

1-Rich fire detecting system.

 $1-18''/36'' \times 10''$ gap lathe; $2-15'' \times 5''$ engine lathe; 1-16" back geared shaper; 1-20" upright drill press; 1-dry grinder; 1-sensitive drill press; all motor dri.en.

Fathometer Equipment 1—fathometer equipment complete.

AUXILIARY LIGHT AND POWER PLANT.—The auxiliary generating plant consists of:

room.

40" model S.T.I.

4—Steam turbines rated 500 kw., 4,779 r.p.m., 5 stages connected through gears to

4-500 kw., 900 r.p.m., 120/240 volt generators.

Turbines are suitable for operating at 300 lbs. steam pressure per sq. in. and 200° F. superheat, one of them being arranged for non-condensing operation at reduced load with 175 lbs. steam pressure and 15 lbs. back pressure.

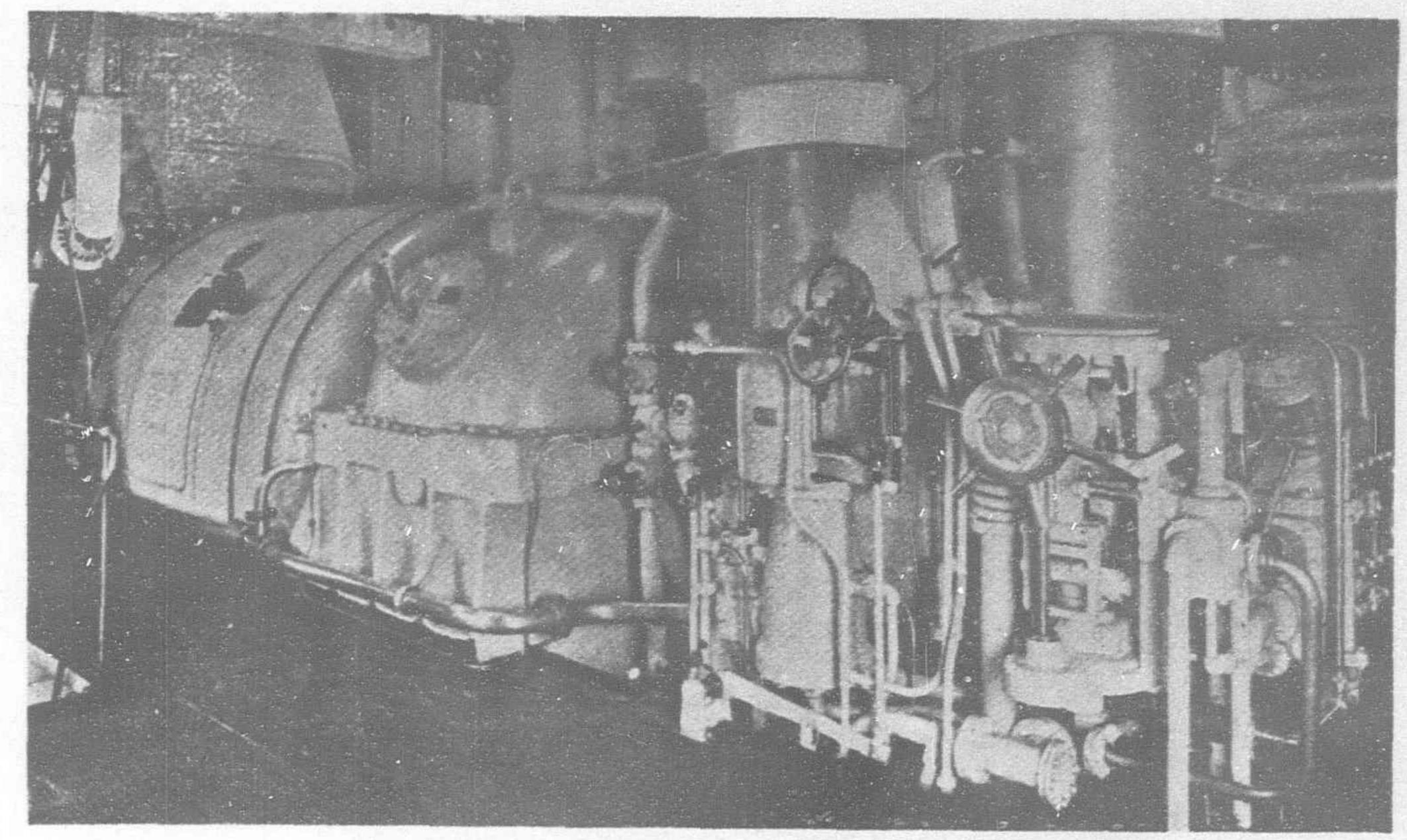
A special feature of the auxiliary generator turbines is the provision of overload capacity to carry the load required for over excitation of the propulsion generators when starting up, superimposed on normal rated generator load. The generators are of the modified 3-wire type each having a compensator for supplying the excitation neutral bus.

The neutral for the 115/230 volt 3-wire lighting system is supplied from two 300 ampere rotary balancer sets arranged for

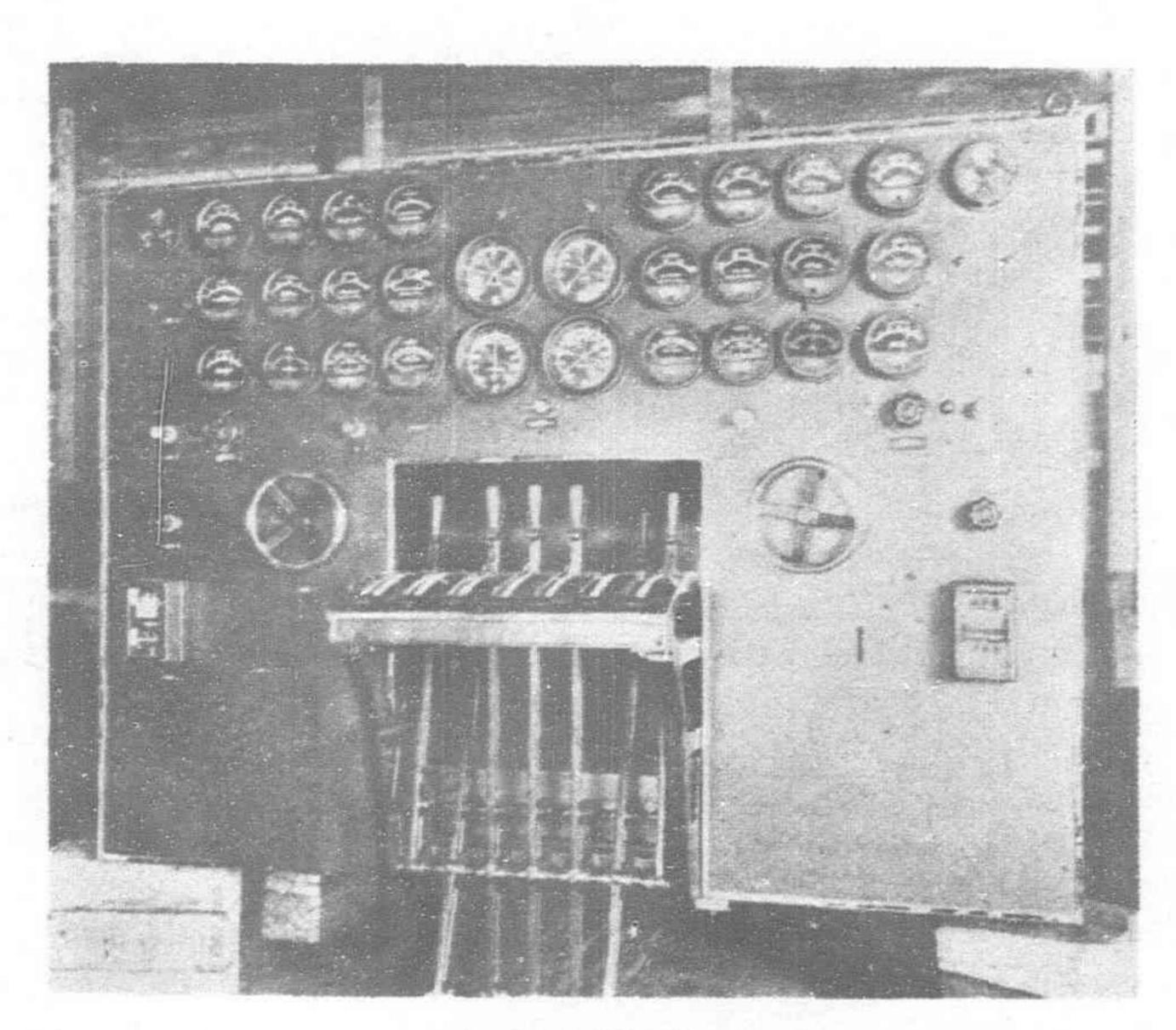
operation singly or in parallel.

The main d.c. switchboard consist of thirteen panels, the overall dimensions being 29-ft. 8-in. long by 7-ft. high, exclusive of the blank filler sections at the top.

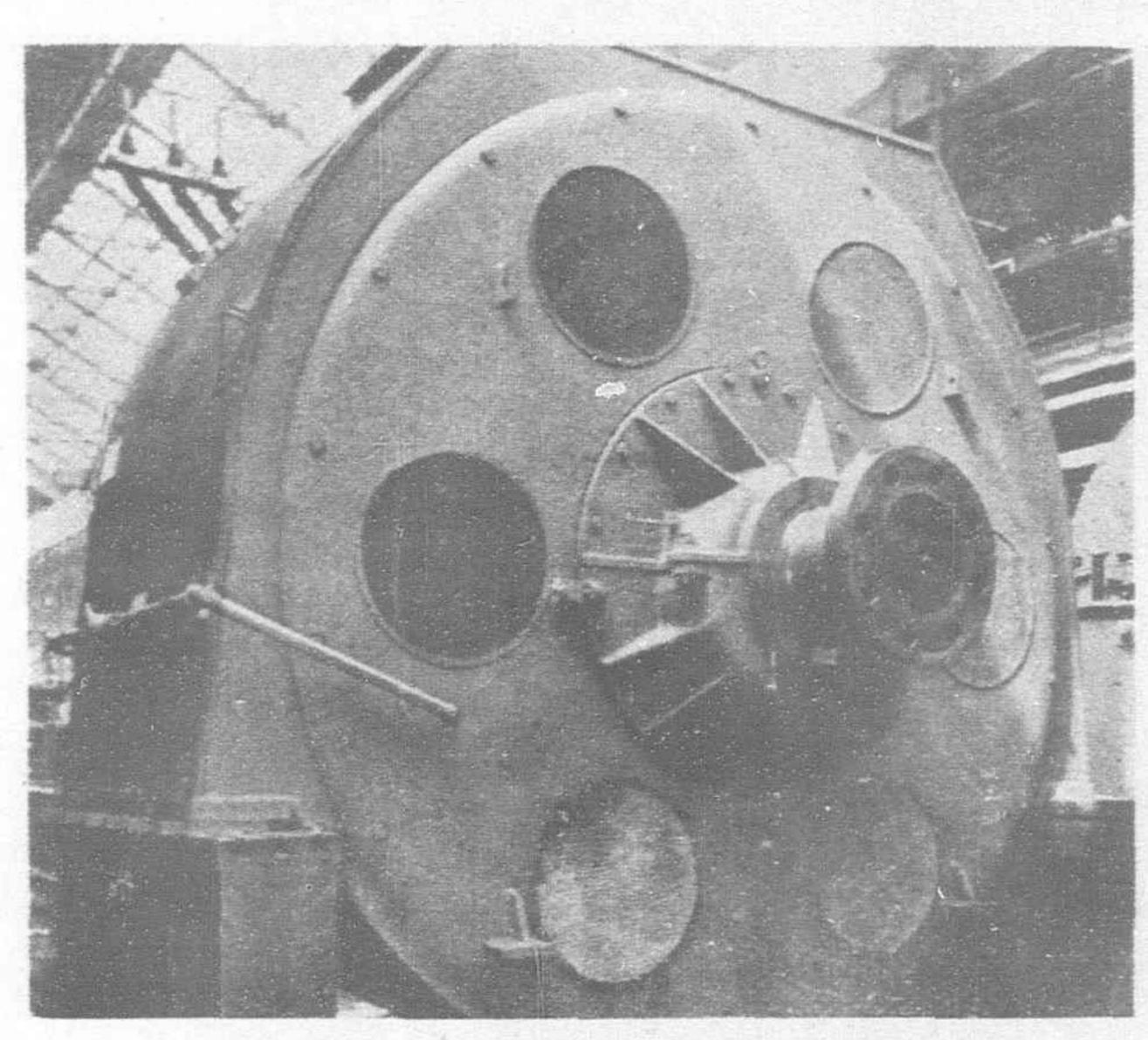
Two independent bus systems are provided, one for excitation and propulsion auxiliaries and one for general power and lighting and the generator switches are made double throw to feed either bus. Any desired combination of the four generators may be run in parallel on the general power bus but the switches are mechanically interlocked to prevent the paralleling of any two generators on the excitation bus although any one can be used for supplying this bus. Each generator, when operating on the general power bus is protected by a single-pole time-limit overload and reverse current



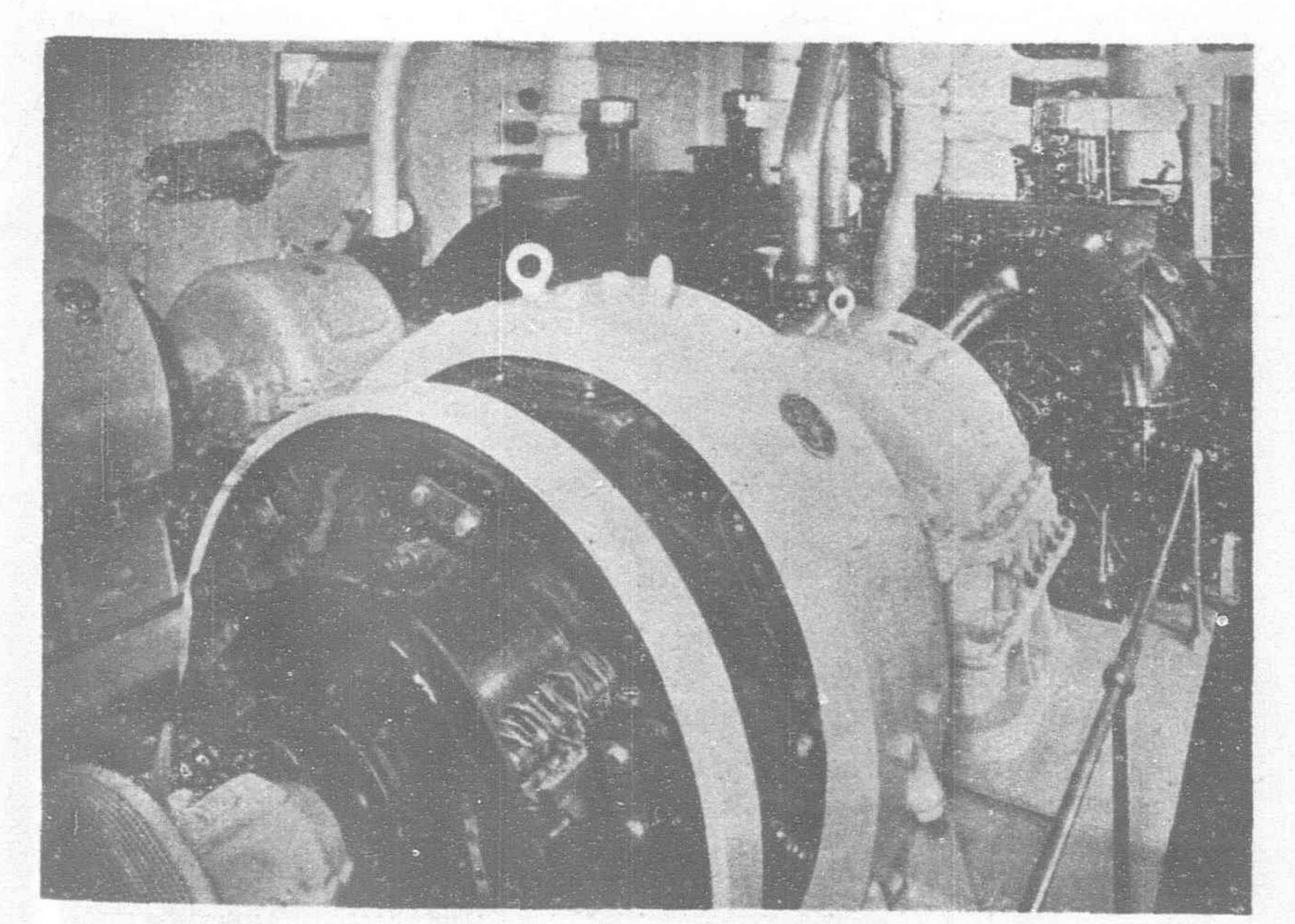
One of the General-Electric Turbo-Generating Sets of the Main Propulsion Plant of the "President Hoover" showing Steam Control which may be arranged either for constant Turbine Speed or for constant Steam Flow



Control Equipment



Propulsion Motor



On the Generator Flat of the "President Hoover's Engine Room are installed four General-Electric 500-kilowatt Turbo-Generating sets

circuit breaker but to insure continuity of service the excitation bus is without automatic overload protection. However, the individual motor starting panels have overload relays.

The feeder switches for propulsion excitation and all important propulsion auxiliaries are double throw so that supply may be either from the excitation or general power bus. Normally excitation and all propulsion auxiliaries are fed from the excitation bus up to the limit of the rating of the one generator supplying this bus. All other power feeders and all lighting feeders are arranged for connection to the general power bus only, circuit breakers being used for all feeders beyond the capacity of a 200 ampere switch.

For control of auxiliaries which cannot be conveniently supplied directly from the main d.c. switch-board, twelve power distribution panels are installed in various parts of the ship.

There are installed on the ship a total of 187 motor driven auxiliaries with an aggregate rating of considerably more than 3,000 h.p. The motors are, in general, of the enclosed ventilated drip proof type for under deck auxiliaries and enclosed waterproof for deck auxiliaries. Practically all controllers are of the magnetic contactor type with drum type master controllers for the cargo

winch and warping capstan motors and pushbutton control for others.

For auxiliaries in engine and fire rooms the starters, push-buttons and also the field rheostats for adjustable speed motors are located adjacent to the respective motors. Elsewhere, for convenience of installation, operation and maintenance special compartments are provided in which are installed the power distribution panels and motor starters. Master controllers for winches and capstans are located at the respective motors; pushbuttons and field rheostats for machinery space and galley ventilation fans are located in the spaces served; other pushbuttons and field rheostats are, in general, installed in the electrical control stations.

For propulsion auxiliary motors special indicators are provided and installed on the main operating level. For each motors a shutter marked "off" and "on" is set manually to show which motors are in use. For each motor there is also provided a green bull's-eye light which shows when it is lighted that the corresponding motor is actually running. Interruption of service is shown immediately by the extinguishing of the bull's-eye light and the shutter shows which motor has been running so that it can be re-started without investigation of the setting of the valves of the piping system. There is also a similar light indication on top the motor starter.

EMERGENCY LIGHT AND POWER PLANT.—The source of supply for the emergency lighting and power system consists of two 15 kw., 120/240 volts, 3-wire direct current generators each directly connected to a gasoline engine, also a 140 ampere-hour 240 volt (120 cell) storage battery. The battery is installed primarily as a final reserve for the radio but its capacity is sufficient to supply also the emergency lights for about helf hour. Upon failure of the main supply the emergency bus is immediately transferred to the battery by an automatic throw-over switch and is automatically returned to the generator supply when the main service is restored or when one or both of the emergency generators are started. A special manually operated switch is provided whereby the radio system can be supplied directly from the battery with the remainder of the emergency system dead or supplied from the generators.

Power from this emergency plant is also available for the gyro compass, running lights, 18-in. searchlight, whistle operator, fire alarm, and watertight doors. Also in case of necessity the emergency generators may be used for supplying the machine tools, galley equipment or any other service on the ship up to the limit of their capacity.

There is a total of 50 miles of electric lighting and power cable ranging in size from quarter inch to 2-in. in diameter and containing a total of 750 miles of copper wire.

Refrigerating System

Refrigerating Machinery.—The refrigerating machinery is of the CO₂ compression brine circulating type and was furnished complete by the Brunswick-Kroeschell Company. It is installed on the tank tep in No. 4 hold in the space between the main shafts just aft of the engine room and with direct access thereto. There are four vertical three-cylinder single-acting CO₂ compressors of such capacity that three of them will maintain during tropical conditions (with sea water at not less than 85°F) the required temperatures in the various cold storage spaces. The fourth machine will be held in reserve as a spare unit. Each compressor is direct connected to a General Electric Company motor, developing 90 h.p. at 320 r.p.m. and using direct current at 230 volts. (Motors for the *President Coolidge* are made by Westinghouse Electric Company.)

Four CO₂ condensers are provided, each of sufficient capacity for condensing the gas from one machine when running at full power under normal conditions, but reserve capacity has been provided so that three condensers are capable of condensing the gas from the four machines under emergency conditions. Condensers have cast iron shells and extra heavy copper coils.

There are four brine coolers, each of sufficient capacity for the full normal capacity of one compressor, and capable of cooling brine to a temperature of 10°F.

All pumps are motor driven, single stage double suction centrifugal pumps made by the Warren Pump Company. There are provided three 3-in. direct connected motor driven brine circulat-

ing pumps for circulating brine from the coolers to and from the cooling coils of the refrigerated spaces. Each pump has sufficient capacity to carry half the full refrigeration load when three machines are working at full power, the third pump acting as a spare. Connections have been provided so that any of the pumps can be operated with any of the brine coolers or circuits. A 1½-in. brine circulating pump is installed for circulating brine in the ship's cold storage boxes, with an emergency connection to this system from the main system for use if the small pump should fail. There have been installed two 5-in. direct connected motor driven cooling water circulating pumps for the CO₂ condensers, each of sufficient capacity for the entire load of the four machines when working at full power under emergency conditions. A 1-in. ice water circulating pump is provided for the drinking water system. (See Piping Systems.)

In addition to cooling the various refrigerated cargo and ship's cold storage spaces to the temperatures mentioned, the refrigerating plant also performs the duty of making one ton of ice a day and of cooling sufficient drinking water for the passengers and crew, in a 150 gallon scuttlebutt located in the refrigerated machinery space. The efficiency of the plant is such that, with cooling water at 70°F, and the atmosphere at 80°F, the empty refrigerated spaces can be cooled to the lowest range of temperature stated above in twelve hours.

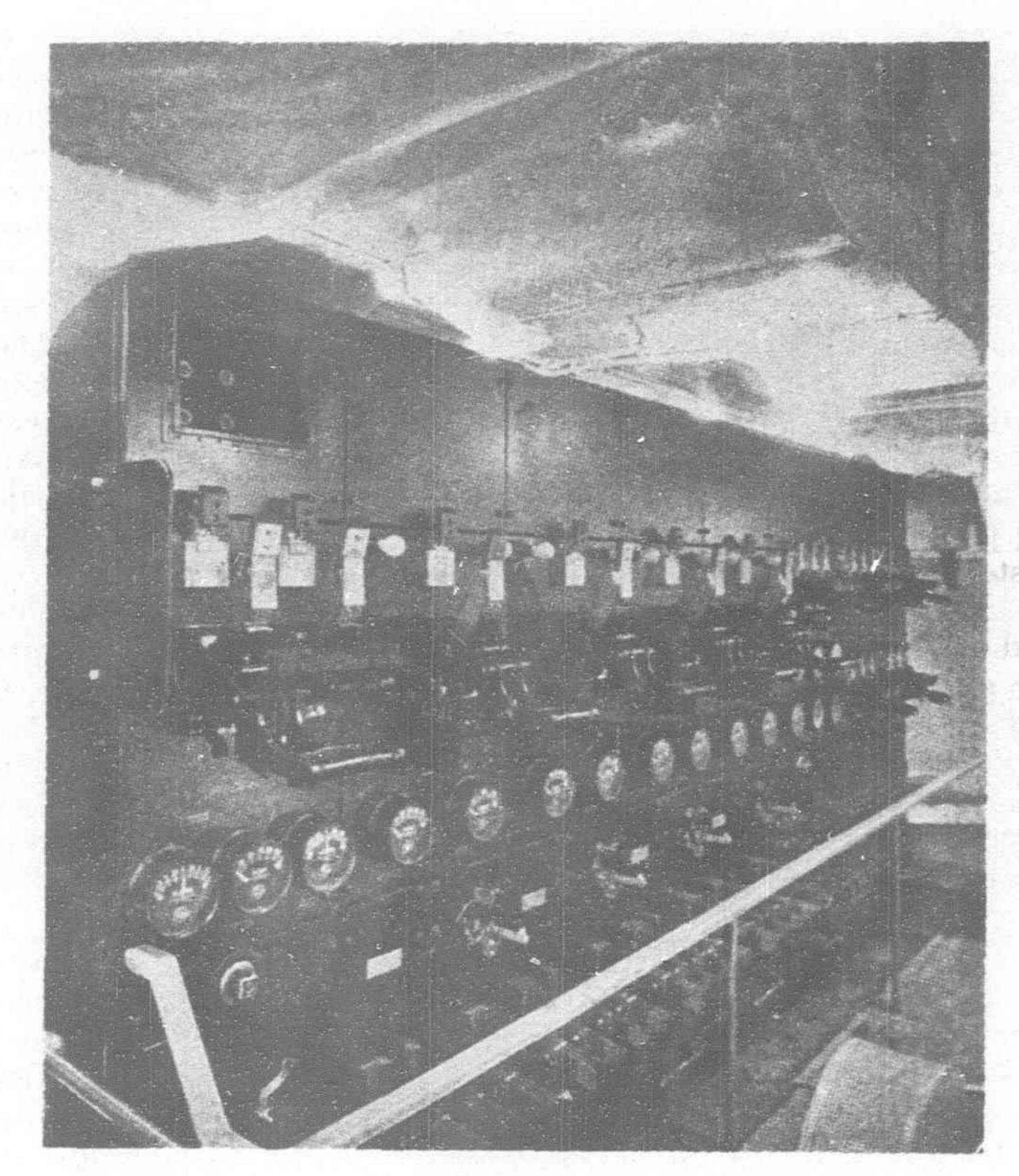
Cold Storage Spaces.—The refrigerated cargo spaces on the lower and main decks are arranged for air-cooling frozen or chilled cargo to temperatures varying from 5° to 50°, and have a total net capacity of about 40,000 cubic feet. The refrigerated cargo space on the orlop deck and the ship's cold storage rooms on the main deck are arranged for brine cooling. This orlop deck cargo space has a total net capacity of about 20,000 cubic feet and may be cooled to temperatures varying from 5° to 40°F, for frozen or chilled cargo. The ship's cold storage rooms, including the butcher shop, meat box and small built-in pantry refrigerators, which are also cooled by the same system, have a total net capacity of about 21,000 cubic feet, and the various rooms may be cooled to temperatures ranging from 50°F, for fruits and vegetables down to 12°F, for the ice cream room, which provides storage for 6,000 quart bricks.

The air cooled refrigerated cargo spaces are cooled by an American Blower Company "Sirocco" fan in each room, mounted overhead in an air duct and driven by a Westinghouse motor installed under the beams in the working passage. This fan discharges air over cooling coils in an overhead duct across one end of the room and into a longitudinal duct at the side of the room, from which it is discharged through openings in the sides and bottom of a shallow apron duct covering the entire wall of the room. Exhaust air is drawn off through a similar apron along the opposite side of the room, and returns through an overhead duct to the fan.

The brine cooled refrigerated cargo space on the orlop deck is arranged similarly to the air cooled space on the lower deck, but is not equipped with fans, air ducts or aprons. Cooling coils are mounted on the walls and overhead in all brine cooled cargo spaces, and on the walls only in certain of the ship's cold storage spaces.

It is worthy of note that in order to provide for carrying either chilled or frozen cargo, a widely different temperature being required in each case, two separate brine systems, complete with evaporators, condensers, brine pumps, supply headers and return tanks, are provided, one for low temperature brine and the other for brine at a higher temperature, but so piped that all the units may be thrown into either system. The cooling coils in the refrigerated cargo spaces (both air cooled and brine cooled) may be supplied with either low or high temperature brine, depending on whether frozen or chilled cargo is being carried; the ship's cold storage cooling coils are supplied with low temperature brine only.

All brine cooling coils were furnished by the Brunswick-Kroechell Company and more than $5\frac{1}{2}$ miles of galvanized pipe, of 1-in. to $1\frac{1}{2}$ -in. diameter, were used in making up these coils. All air ducts, aprons, ports, dampers, air cooling chambers, insulation, and woodwork generally, and all coil supports, brine valves, fittings and piping were furnished by the Newport News Shipbuilding and Dry Dock Company. Brine thermometers were supplied by the C. J. Tagliabue Co. and the electric distant reading thermometers for the cold storage rooms were furnished by Leeds and Northrup.



Main Switch-board controlling the Power and Lighting Circuits. Fifty miles of conductors are tributary to this Board

Otis Elevators Used

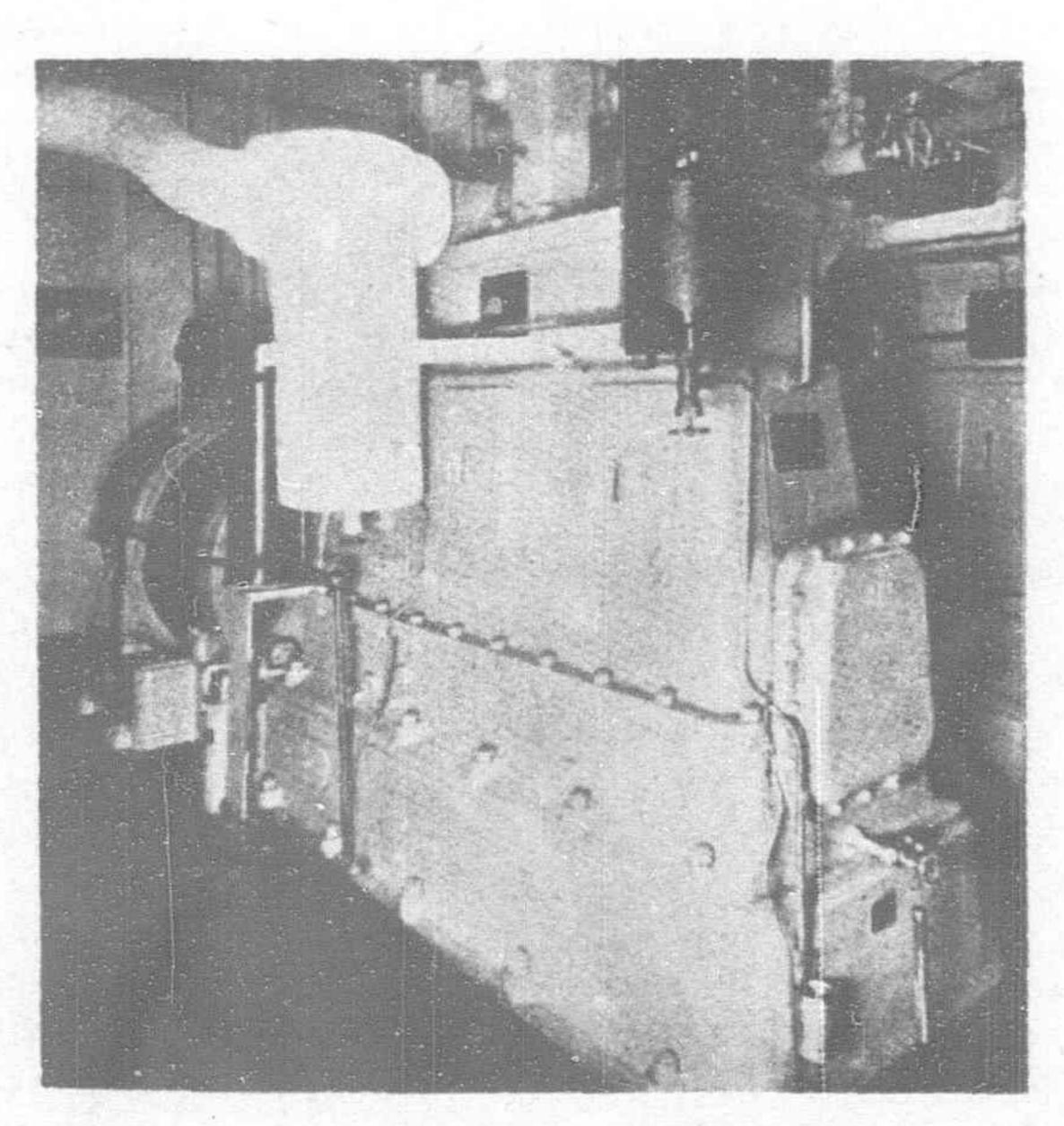
Two electric passenger elevators, enclosed in steel trunks, are provided, off of the 1st class main entrance lobby, the starboard elevator for passengers only and the port elevator arranged to also carry baggage when required. The elevators have platforms about 4-ft. 8-in. square and are capable of lifting a net weight of 1,800 lbs. at a speed of 200 feet per minute. Both elevators serve the four main passenger decks, upper, shelter, bridge and promenade, with landings in the various passenger lobbies on these decks, and in addition, the port elevator has an upper landing in the forward boat deck lobby and a lower landing on the main deck adjacent to the 1st class baggage room.

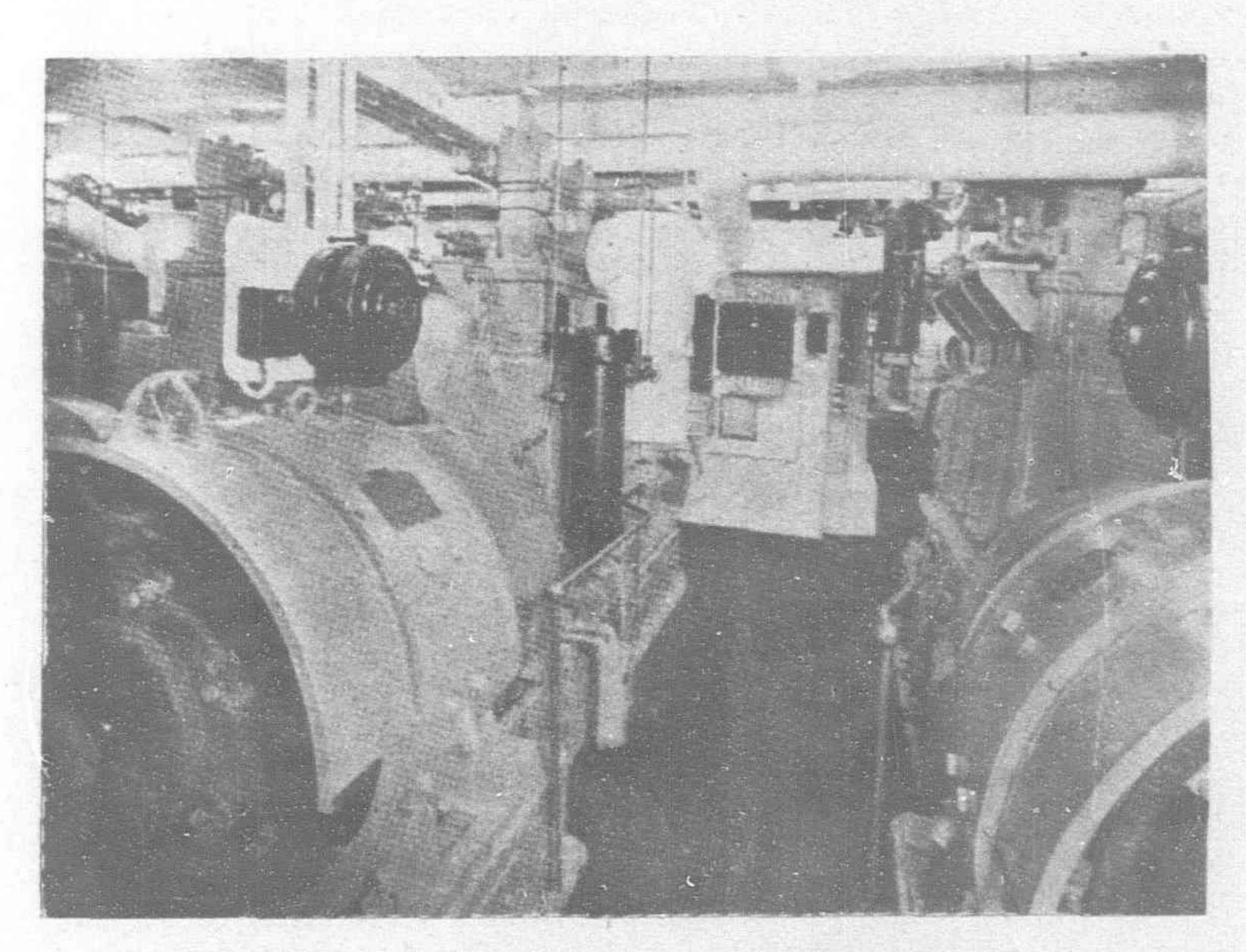
Both elevators are provided with full electro-magnetic control, having an operating switch in the car which is electrically connected to the magnets on the controller panel to control direction of travel, and are equipped with a floor leveling device to bring the car automatically level with the landing.

The cars are of metal with ventilating grille around the top and are finished in medium green baked enamel with ornament of modern design in keeping with the architectural treatment of the lobbies. Cars have pantagraph gates of chromium plated bronze and overhead ceiling and cornice of polished stainless steel, with dome light in center. The floors are covered with rubber tile, in a color scheme of terra cotta and various shades of green, laid on a hardwood floor installed above the sub-floor of the car. Cars are provided with the necessary switches, outlet connections for lights, flashlight annunciators, etc., in accordance with the most modern practice on passenger elevators in similar service on shore. Sliding elevator doors of special design, having hollow steel frames filled with wood and covered with sprayed brass finish, and panels of polished brass grille work with sheet brass back, are fitted at landings in passenger lobbies on all decks. Door frames, jambs and slides were furnished by the Dahlstrom Metallic Door Company of Jamestown, N.Y. and were ornamented and finished by the Newport News Shipbuilding and Dry Dock Company in their own shops. The car for the port elevator is provided with a portable grating for protecting the floor and portable pads for covering the sides of the car when carrying luggage, the grating being padded on the back so as not to mar the rubber tiling.

For the convenience of the ships' engineer officers, an elevator is installed in the forward end of the engine casing, operating between the engine room and the engineers' quarters on the boat deck, with landings at the main deck, shelter deck and boat deck. The elevator has a platform about 3-ft. 8-in. by 3-ft. $10\frac{1}{2}$ -in. and the car is enclosed by a sheet steel wainscot with wire grille above; it is capable of lifting 1,000 lbs. net at a speed of 100-ft. per minute. This elevator has full automatic push button control.

All elevator machines are of the direct connected single worm and gear traction sheave type, with all parts mounted on a common bedplate. The elevators and their machinery for both the President Hoover and President Coolidge were designed and built by the Otis Elevator Company. Each ship has three elevators, composed of one micro-drive self levelling passenger elevator traveling from "D" to "A" deck with a vertical rise of 28 feet, one combination passenger and baggage micro-drive self leveling elevator traveling from "E" deck to the boat deck with a vertical rise of 50 feet, and one engineers' elevator traveling from "E" deck to the boat deck, with a vertical rise of about 49 feet. The passenger elevator and the combination baggage and passenger elevator travels at the rate of 200 feet per minute, which is about twice the rate of speed of the ordinary ship elevator. The passenger elevator hatch-way or corridor entrance doors, as well as the elevator cars are all of beautiful design and finish, blending with the general adjacent color scheme. The cars indoors are of steel with enamelled finish in solid white bronze trim on ornaments and car gates.





The Refrigeration Machinery Compartment showing three of the four vertical 3-cylinder Brunswick-Kroeschell Carbon Dioxide Compressors and their 90-horsepower General-Electric Motors

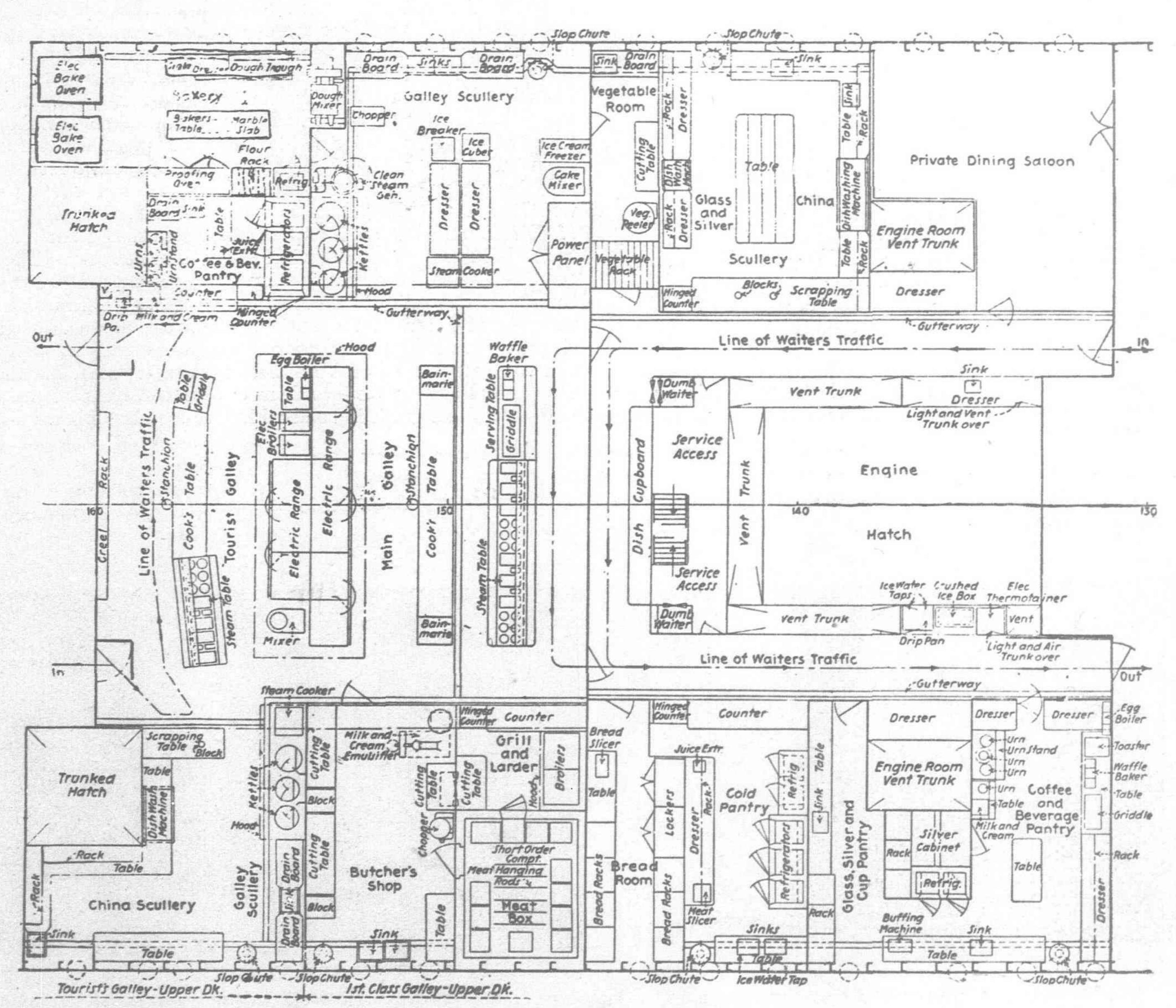


Main Galley showing Edison Electric Ranges

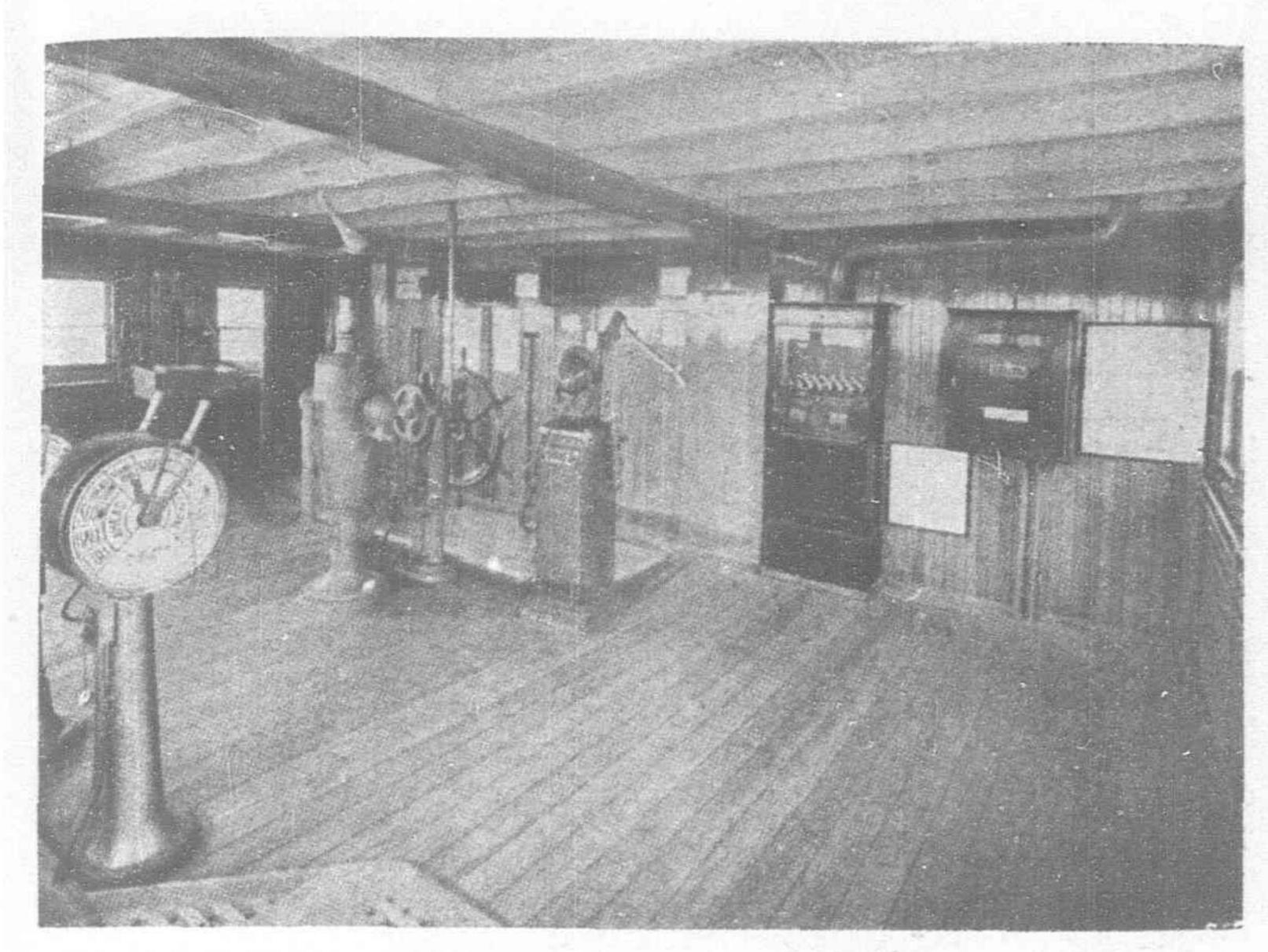
Elevator installations on large steamers present many problems that are not at once apparent. For instance, ship elevators must not get "sea-sick," and therefore the elevators installed aboard the *President Hoover* and *President Coolidge* have special safe-guards, in addition to those supplied for elevators operating under normal conditions in buildings. Rolling and

pitching of the vessels and the damp salt atmosphere in which the elevator operates are factors that have to be taken into consideration, and obviously all the apparatus has to be designed to occupy a minimum of space.

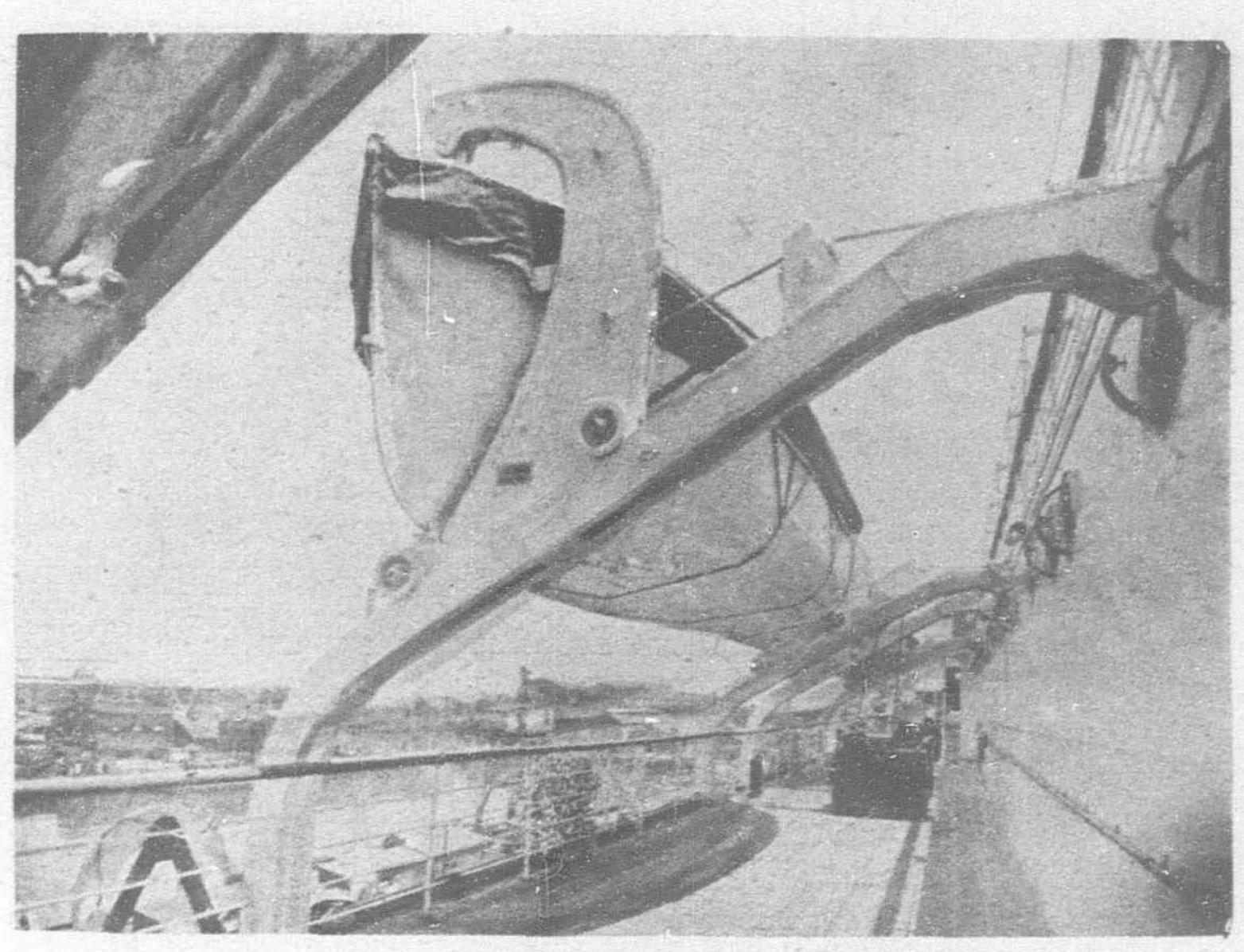
The controller switches are so constructed that they will not close when the vessels roll or pitch. The general method of accom-



Plan of Main Galley and Pantries



Enclosed bridge featuring magnetic compass steering stand, Sperry gyro-repeater and gyro-pilot, Rich smoke direction cabinet, Watertight door control and Engine Room Telegraph



View on Boat Deck showing 92-Person Welin Life-boats mounted on Welin-MacLauchlan gravity type davits equipped with winches for raising the boats

plishing this is by using the solenoid type of switch with the armature moving vertically to make contact, or by using the clapper type switch on which springs are mounted with sufficient tension to prevent the switch from closing due to its own weight.

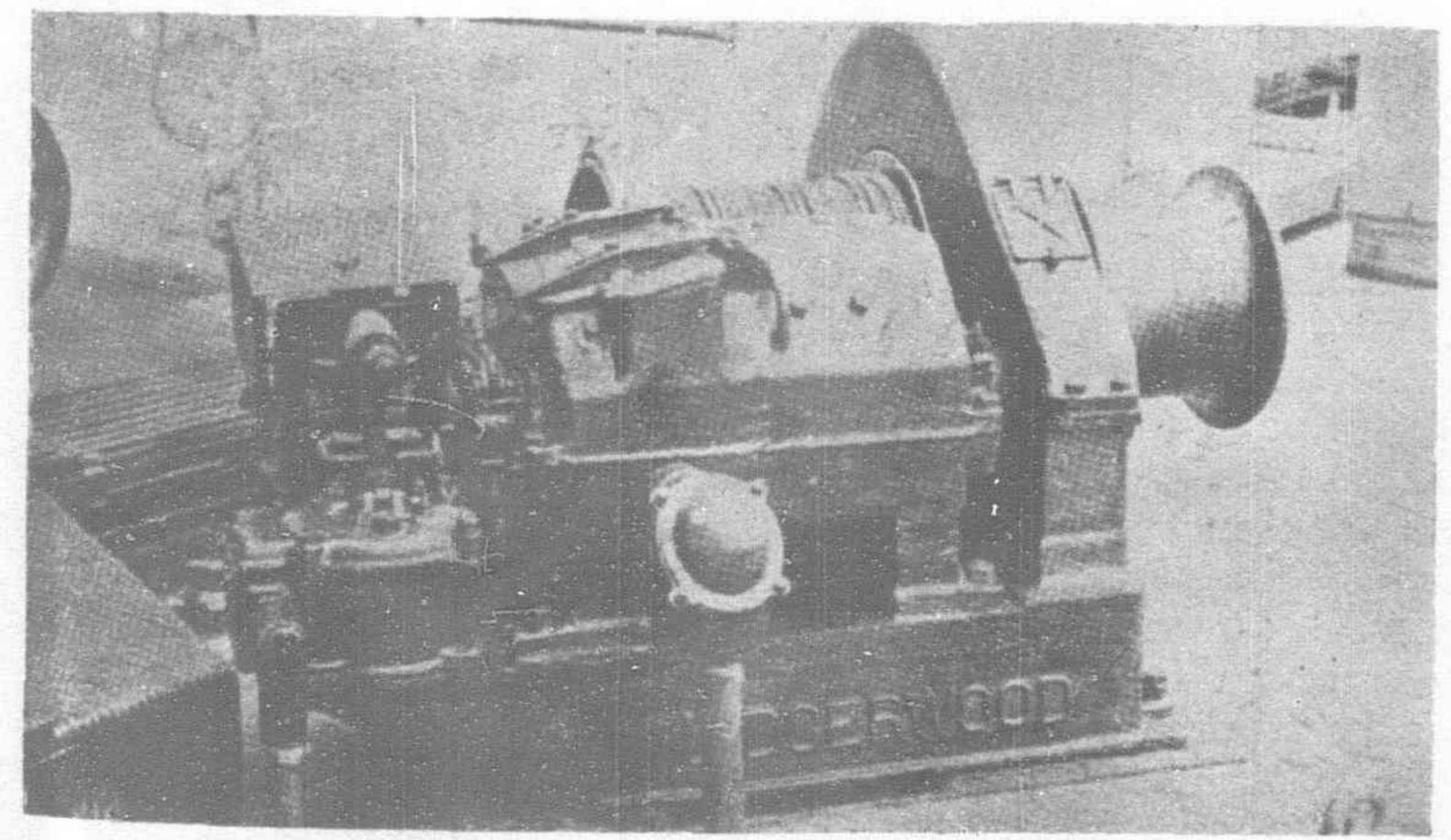
The traveling cables which carry the control wires to the elevator car cannot be allowed to hang free from the bottom of the car as on land installations, for the cables would swing and the loop of the cable would catch on obstructions in the hatch, resulting in broken electrical connections and consequent shut-downs. It was necessary, therefore, to provide for each elevator a protective duct or sheath made of sheet metal for the travelling cable extending the full height of the elevator hatch. Since the cable is confined



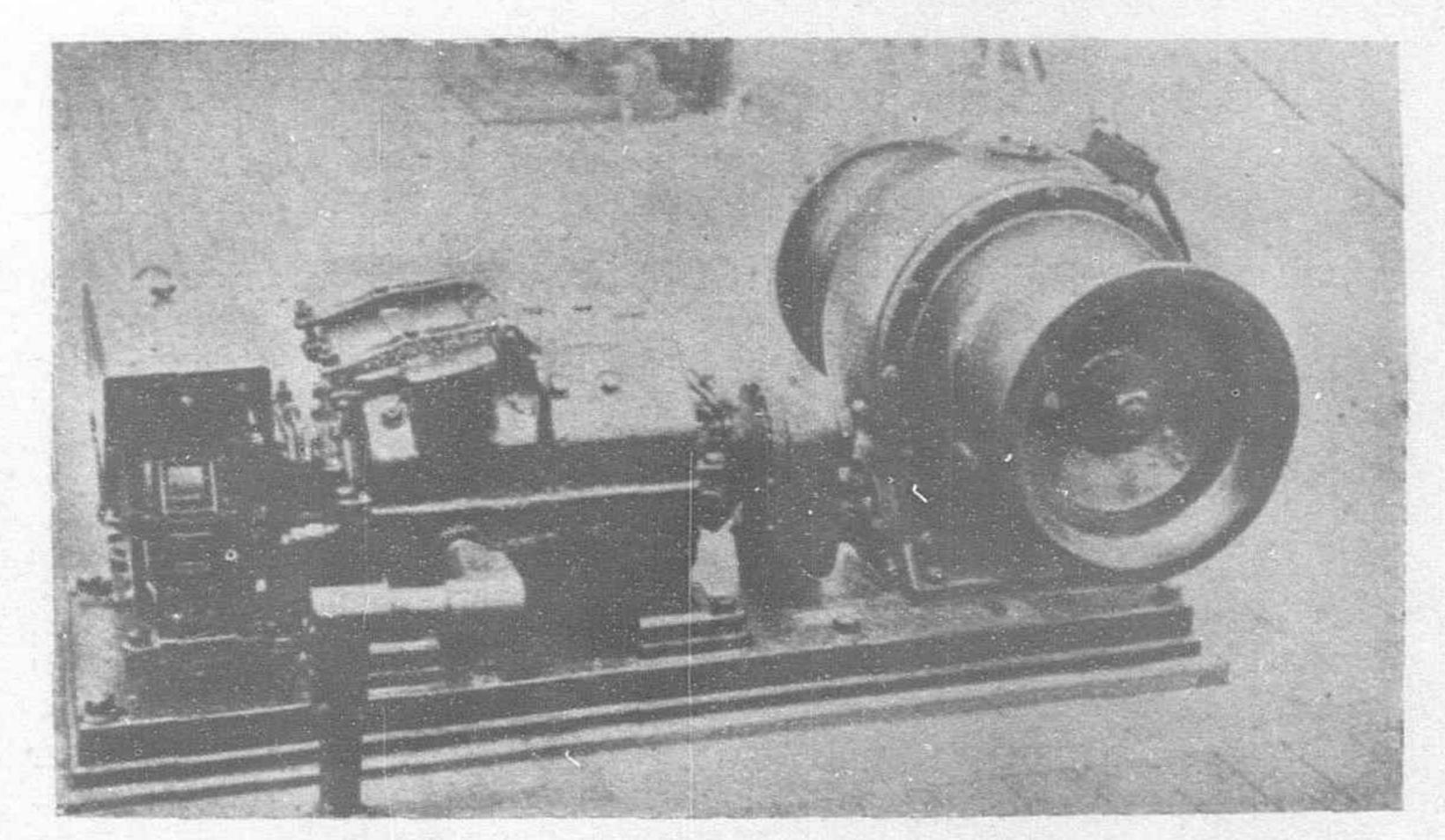
View of the top of the house at the After End of Bridge Deck showing three of the Four Cargo Winches serving the After Cargo Hatch. Note Power substation erection at the base of the mast for housing control apparatus for Winch Motors

within the duct it cannot catch on to obstructions.

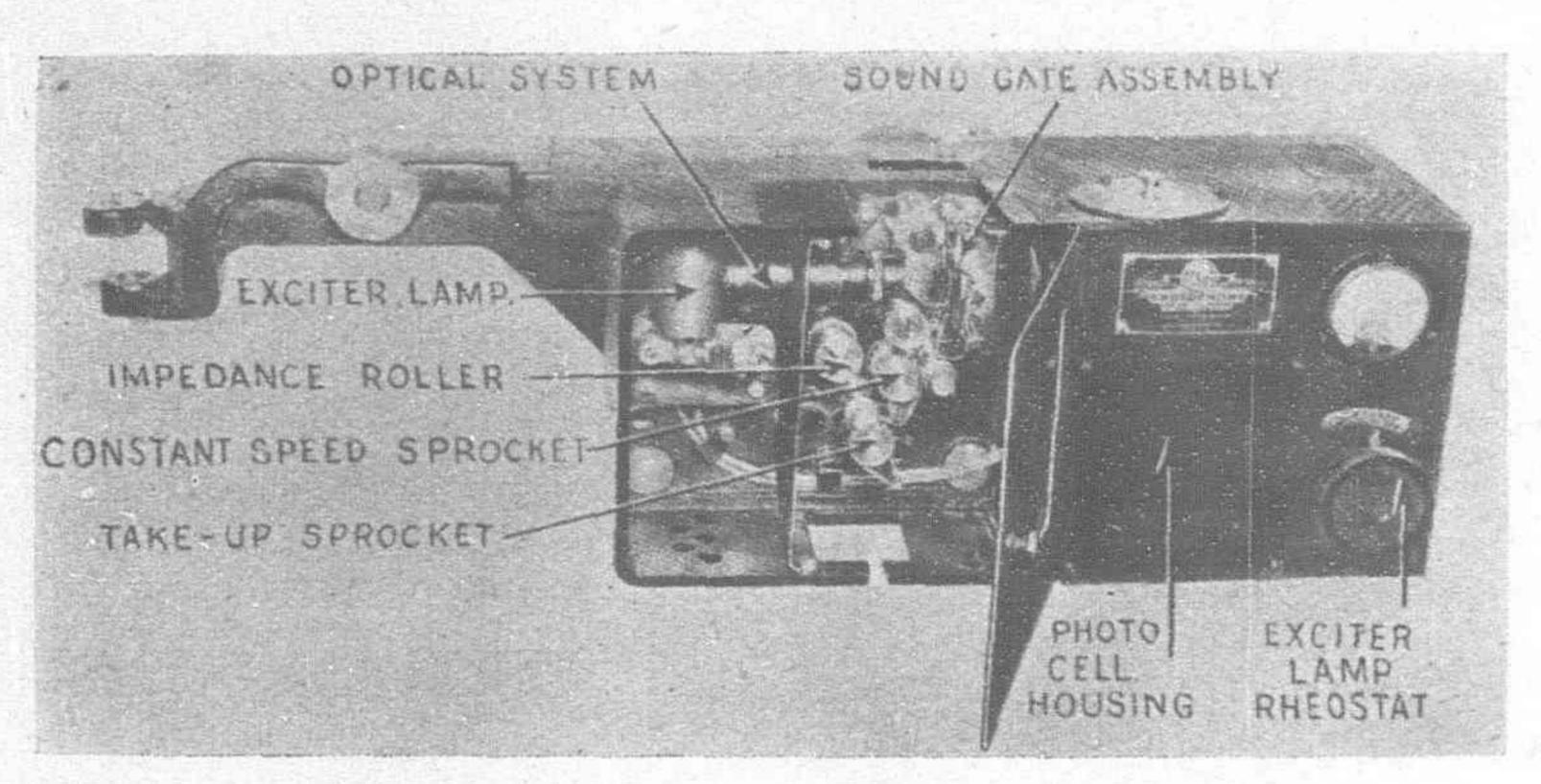
All oil reservoirs for the motor bearings, worms and gears had to be designed to prevent spilling of oil, and at the same time to insure adequate lubrication for all parts. Since these elevators operate continually in a damp salty atmosphere all vital parts have to be protected against rust and corrosion. The car parts and also the counter - weight safety parts had to have a rust-resistant finish, such as Parkerizing or Cadmium Plating to insure that these parts do not fail to operate. All iron and steel parts of controller switches, limit switches, gate contacts and the like had to have rust proof finishers, and all structural iron parts such as control frame, car frame and rail fastenings were painted with red lead.



Close-up of Lidgerwood Single Geared Single Drum Heavy Duty Winch



Close-up of Hyde Worm-Gear Motor-Drivan Winch for Handling the four Life-boats on the after island



The R.C.A. photophone sound-movie apparatus

"The World's Word for Elevator Safety" is the slogan of the Otis Elevator Co, and their installations on these President ships verify that statement. It is of passing interest to record that the Otis Elevator Company was the pioneer in providing elevators for steamers, the first having been installed by the company on the ill-fated steamer Lusitania.

Cargo Handling Gear

No. 1 Hold

EXTENT.—Frames 19 to 46, inner bottom to bridge deck.

HATCHES.—18-ft. 9-in. by 18-ft. 0-in. on center line through all decks, orlop to bridge inclusive; trunked between upper and bridge decks,. W. T. hinged steel cover at bridge deck. Wood covers at other decks.

Booms.—3 5 tons capacity each, tubular steel. One on center line, 35-ft. 0-in. long. One port and one starboard each 61-ft. 6-in. long. At forward side of foremast.

Winches.—At bridge deck, 3 reversible single-drum electric spur-geared winches with gypsy head on outboard side. Capacity of each winch: 3,000 lbs. at 340-ft. per minute on a single line. All winches made by Lidgerwood Mfg. Co.; General Electric Co. electrical equipment on H-339 and Westinghouse equipment on H-340. 35 h.p. motor, 300 r.p.m ., d.c., 230 volts. Magnetic brake on motor, friction brake on drum.

No. 2 Hold

EXTENT.—Frames 46 to 71, inner bottom to bridge deck, including space for mail or special cargo, frames 63 to 71, main deck.

HATCHES.—1 20-ft. 6-in. by 30-ft. 0-in., through all decks, orlop to bridge, inclusive, on center line. Trunked between shelter and bridge decks.

2 9-ft. 0-in. by 10-ft. 0-in., one port and one starboard, through main and lower decks. Watertight hinged steel covers at bridgedeck hatch, in two sections, one each side of center line. Wood hatch covers at other decks.

Booms.-- 1 30-tons capacity, tubular steel, on center line, 68-ft. 0-in. long, at foremast.

4 5-tons capacity each, tubular steel, one port and one starboard, 61-ft. 6-in. long, one port and one starboard, 36-ft. 0-in. at after side of formeast.

Winches.—2 single-drum electric winches, same as for No. 1 hatch, at bridge deck.

2 reversible single-drum electric spur-geared winches, at bridge deck, with high-speed gearing for same duty as singlegeared winches, and low-speed gearing, 11,000 lbs. capacity, for 8-part tackle from 30-ton boom topping lift and cargo hoist. Same motor as single-geared winch.

2 Hyde electric automobile handling capstans, at upper deck, with 18-in. barrel, and 15 h.p. motor, 800 r.p.m., d.c., 230 volts, General Electric Company's electrical equipment on H-339; Westinghouse on H-340.

Ports.—2 8-ft. 1-in. by 8-ft. 1-in. between upper and shelter decks, one port and one starboard.

2 8-ft. 1-in. by 6-ft. 111-in. between upper and shelter decks, to special cargo space, one port and one starboard. Doors split vertically into two sections, hinged inboard.

No. 3 Hold

EXTENT.—Frames 71 to 86, inner bottom to main deck. Frames 71 to 93, main deck to upper deck.

Hatches.—2 18-ft. 0-in. by 19-ft. 0-in. through orlop, lower and main decks, one port and one starboard. Wood covers.

Booms.—None.

Cargo Cranes.—4 1½ tons capacity each, two port and two starboard.

Tramway Hoists.—4 1,000 lbs. capacity each, arranged to hoist cargo from barges alongside through cargo ports, using same winches as for cargo crares. Trolley overhauled by hand power winch.

Winches.—4 reversible single drum electric spur geared winches without gypsy heads, two port and two starboard, on main deck. Capacity of each winch 3,000 lbs. at 175-ft. per minute, 25 h.p. motor, 575 r.p.m., d.c., 230 volts.

Ports.—4 8-ft. 1-in. by 7-ft. 1½-in. between main and upper decks, two port and two starboard. Doors split vertically into

two sections, hinged inboard.

No. 4 Hold

Extent.—Frames 146 to 170, orlop to upper deck. Insulated for refrigerated cargo on orlop and lower decks and for refrigerated cargo and ship's stores on main deck.

Hatches.—2 10-ft. 0-in. by 10-ft. 0-in. through lower, main, upper, shelter and bridge decks, one port and one starboard. Trunked for entire height. Ordinary wood covers at all decks,

Booms.—4 3-tons capacity each; tubular steel; on forward side of king posts at bridge deck. Two port and two starboard; outboard booms 51-ft. 0-in. long; inboard booms 36-ft. 0-in. long.

Winches.—4-single drum electric winches, same as for No. 1 hatch, two port and two starboard.

No. 5 Hold

EXTENT.—Frames 170 to 189, orlop to shelter deck.

Hatches.—1 21-ft. 0-in. by 30-ft. 0-in. through orlop, lower, main, upper, shelter and bridge decks, on center line, opening reduced to 16-ft. 8-in. by 25-ft. 8-in. at shelter deck and to 16-ft. 0-in. by 25-ft. 0-in. at bridge deck; on center line. Trunked between main and bridge deck. W. T. steel covers at shelter deck, forming bottom of special class swimming pool. Wood covers at other decks.

Booms.—4 5 tons capacity each, tubular steel, two port and two starboard; outboard booms 63-ft. 6-in. long; inboard booms 39-ft. 6-in. long; at forward side of mainmast.

Winches.—4 single drum electric winches, same as for No. 1

hetch, two port and two starboard.

No. 6 Hold

EXTENT.—Frames 189 to 212, orlop to shelter deck.

Hatches.—1 19-ft. 6-in. by 30-ft. 0-in. on center line, through lower, main, upper, shelter and bridge decks. Trunked between main and bridge decks. Wood covers at all decks.

Booms.—4 5-tons capacity each, tubular steel; two port and two starboard; outboard booms 63-ft. 6-in. long, inboard booms

37-ft. 3-in. long; at after side of mainmast. Winches.—4 single drum electric winches, same as for No. 1 hatch, two port and two starboard.

Steering Gear

Type.—Hyro-electric type, American Engineering Company make, consisting of (4) cylinders with (2) double plungers selfcontained on one bedplate and double connecting links to crosshead on rudder stock.

Location.—Forward of rudder stock, on lower deck.

Pumping Sets.—In duplicate, with automatic follow-up mechanism, relief valves and by-pass valves as necessary. Valves and piping arranged so that either pumping set can be used at will. Each set installed on a structural steel bedplate and consisting of an electric motor, coupled direct to a Hele-Shaw variable stroke delivery pump. Piping between valves and cylinders is extra heavy steel tubing with brazed flanges, and high pressure valves are of Crane make.

Motors.—75 h.p. at 580 r.p.m., d.c., 230 volts. H-339: General Electric Company make; H-340: Westinghouse Electric

Company.

TELEMOTORS.—Hydraulic telemotor and Sperry two-unit gyro-pilot furnished. An electric clutch permits immediate use of hydraulic telemotor in case of failure of gyro-pilot equipment. All parts of telemotor subject to pressure were tested to 500 lb. per square inch before and after installation.

Capacity.—The complete steering gear has ample power for and is designed to stand the pressure incident to putting the rudder from hardover to hardover through a total angle of 70° in thirty seconds when the ship is moving ahead at a speed of 21 knots.

Controls.—1. By hydraulic telemotor from wheel in wheel-

house on navigating bridge forward.

2. By hydraulic telemotor from wheel on top of wheel-house through shafting and gear connection to steering stand in wheel-house, arranged so that lower wheel remains stationary while upper wheel is being used.

3. By hand or automatic steering by gyro-pilot in wheel-

house.

4. By direct connection from wheel in steering gear room.

5. By shafting and gears from wheel in after steering station on bridge deck.

EMERGENCY STEERING ARRANGEMENTS.—Auxiliary tiller bolted to after side of crosshead on rudder stock, operated by tackle blocks and manila rope led through fairlead sheaves and pipes up to electric

capstan on shelter deck aft.

RUDDER INDICATOR.—An electric A.C. rudder indicator is provided, having a transmitter at the rudder head and an indicator located in the wheel-house. The indicator shows the rudder position by single degrees from 1 to 35 degrees each side of center line, and is numbered in steps of 5 degrees. Indicator operates on 110 volt circuit.

Mechanical Ventilation

Mechanical ventilation, by means of supply and exhaust pressure systems is provided for each individual state rocm and toilet space in accommodations for all classes of passengers and in crew's quarters below the boat deck; it is also provided for the passenger public rooms, all galleys, pantries and mess rooms, and the machinery spaces. To facilitate ventilation of the engine room a ventilating stack, of similar size and appearance to the smoke

stack, is fitted above this space.

The 1st class library and the 1st class lounge are provided with exhaust ventilation by means of propeller type fans drawing vitiated air through the ceiling and discharging it directly into the open air above. The 1st class and special class smoking rooms also have exhaust ventilation by means of multivane fans which remove foul air through the ceilings. As all of the above spaces have doors and windows opening on the weather decks, no other fresh air supply is necessary. The 1st class dining saloon, in addition to exhaust ventilation from the top of the well over this space, has a supply system furnishing abundant fresh air which may be warmed in cold weather by means of Sturtevant steam ventilation heaters installed in the supply ducts under the upper deck. The special class dining saloon also has mechanical fresh air supply and the vitiated air is drawn off into the galley exhaust system through the service doors and ventilating louvres in the partition bulkhead at the forward side of the dining-room. All passenger state rooms and lobbies are ventilated by fresh air supply systems, discharging into state rooms through "Punkah" louvres. Supply and exhaust openings in passenger public spaces are fitted with decorative grilles. All toilets, baths and showers, for all passengers and crew, are ventilated by exhaust systems, and all quarters for steerage passengers have complete supply and exhaust systems. All crew's quarters below the boat deck are provided with fresh air supply, with exhaust ventilation, from all crew's mess-rooms and elsewhere, as necessary.

The engine room is supplied with 120,000 cubic feet of fresh air per minute by four silentvane fans, and the vitiated air is exhausted into the ventilating stack by mechanical ventilation through the main motor ventilating sets and by natural ventilation

through fidley gratings in the sun deck inside that stack.

The main galleys and pantries are provided with fresh air supply and are ventilated by two exhaust systems which draws warm and foul air through hoods over the electric ranges and other cooking equipment. The two silentvane galley exhaust fans are installed in the ventilating stack and discharge into it, thus forcing galley odor to the top of the stack, well clear of the

passenger decks. One of these galley exhaust system sis so arranged that foul air can be exhausted from refrigerated cargo spaces when desired. The steerage and crew's galleys are also ventilated

by supply and exhaust systems.

A total of 39 fans are provided for hull ventilation, consisting of 15 of silentvane type, three of multivane type, and three of propeller type. All fans are located on the weather decks, more than half being on the sun deck, and most of the others on the bridge deck forward and aft. All ventilation fans were supplied by the B. F. Sturtevant Company and are driven by General Electric motors on the *Hoover* and Westinghouse motors on the *Coolidge*.

A tabulation of the hull ventilation systems, listing the spaces ventilated and the capacity and location of the fans, is given below:

No.	Cap'y &	100		ces Ven	tilated				tion of Side	Fan Frames
1	6000	E	Toilets and ba	ths. A.	B. C.T)ks		Sun	P	76/7
2	5000	S	1st class S.R.,						P.	85/6
3	5000	S	230 01003 27201	1, 1,	V ZZMO.			"	S	85/6
4	3200	E	1st class loung	70	"			"	C.L.	88
5	5000	S	1st Class S.R.,		AR			,,,	-8	102/3
6	5000	S	lst class S.R. B Dks.					22	P	100/1
7	4000	E	Crew's toilets,	laundr	v. D D	k		"	8	107/8
8	4000	S	1st class dinin					***	P	109/10
9	4000	S	AUG CAUSS CHILLIA	5 54100	.,			"	S	109/10
10	6000	E	Toilets: Boat	Prom	Aanc	I B Dkg		27	S	113/4
11	6000	S	Crew's S.R., A					"	S	132/3
12	4000	E	1st class smok					22	C.L.	128/9
13	30000	S	Engine Room					29	S	134/5
14	30000	S	THE THOUSE		•			22	P	134/5
15	30000	S	"					"	S	138/9
16	30000	S	"		•			22	P	138/9
17	12000	E	Galleys and pa	ntries	CDk		•	"	8	142/3
18	12000	E	Cancys and pe	all of ices	C DA.			**	P	142/3
19	5000	E	Toilets, Boat,	Prom	A and	R Dlra		"	Q.	145/6
20	6000	8	Galleys and pa					"	P	146/7
21	4000	S	1st class S.R.,				* *	"	8	148/9
22	4000	6	Too Class D.Iv.,	A anu	D DES.			"	P	148/9
23	1860	E	Library "		"	**		Boat	2	68/9
24	6000	E	Steerage Space		400	lra		Prom.	P	184/5
25		-	breerage bpace	es, Can	U D D	M.S.		I tom.	Q.	The second second
26	5000	S	99 99		"				P	183/4
27	5000	322	59 59		"			10	6	185/6
28	4000	E -	Chary Space	D and	O Dlea		• •	Duidos	D	195/6
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35	3000	S	Hospital speci		The state of the s			. 22	C.L.	207/8
36	4000	E	Steerage space					22	P	211/12
37	5000	8	Steerage space					9.9	2	223
38	4000	E	Steerage toilet				1)	***	P	221
39	1800	E	Officers mess-	rooms,	boat d	eek		Boat	P	133

Galley Equipment

The galley cooking equipment is generally electrical and of the most modern type. All bulkheads enclosing the galley and pantry spaces are built of steel, except that certain rooms adjoining the galley are enclosed with expanded metal on the side toward galley, and no wood ceiling has been fitted at sides or overhead in

The galleys for 1st class and special class passengers are both located in the same room amidship on the upper deck, each having its own battery of electric ranges, with the two batteries installed back to back. A galley scullery, a glass, silver and china scullery, and a coffee and beverage pantry are provided for each class of service, and the location of these spaces has been carefully worked out so that waiter traffic from each dining saloon is direct and uninterrupted. A bakery, butcher shop, grill and larder, cold pantry, vegetable room, bread room and daily service meat refrigerator are also provided, each serving both classes of passengers.

In general, all dressers and working tables are of galvanized steel with tops of ash or of rustless Allegheny metal. Space under dressers and tables is fitted up with perforated metal shelves or with metal shelves and lockers. Steam tables have tinned copper pans and monel metal covers, and outside of steel faced with monel metal. Sinks are of welded rust-resisting Armco iron, galvanized.

The electric range for the 1st class galley is made up of six sections arranged in one battery, and the range for the special class galley is made up of three sections, also in one battery. A similar range, in two sections, is provided in the steerage galley on the shelter deck aft and single electric range sections are installed in

separate galleys on the upper deck forward for American and Chinese crew. All ranges are equipped with hood and pan racks, and are of marine type with sea rails around the top and guard rails on the outside; they were furnished by the Edison Electric Appliance Company.

The auxiliary electrical cooking equipment includes an Edison electric griddle and an Edison electric waffle baker in the 1st class galley, and an Edison electric griddle, Edison electric egg boiler, two Edison electric broilers, and an Hobart electric mixer, in the special class galley. The 1st class galley scullery is equipped with a Hobart electric food chopper, a Hobart electric coke mixer, a 40-quart Emery Thompson electric ice cream freezer, a Rheinhold electric ice cuber, and a Creasy electric ice breaker. Steam jacketed Wearever aluminum kettles and Born vegetable steamers are also provided in both the 1st class and special class galley sculleries, and in galleys for steerage passengers and the crew. The 1st class coffee and beverage pantry is equipped with Edison electric appliances, including a broiler, egg boiler, griddle and waffle baker. Stills automatic coffee and hot water urns furnished by the Dohrmann Hotel Supply Company of San Francisco, California, as well as a chocolate urn and a milk and cream dispenser are also provided for this pantry and for the corresponding space for special class service which also has a Sunkist juice extractor. The glass, silver and china scullery spaces for both classes are equipped with Victor electric dish-washing machines and scrapping tables. A Green Electric Company electric silver buffing machine is provided in the 1st class glass, silver and cup pantry. The cold pantry is fitted up with a United States electric meat slicer, a Sunkist electric juice extractor, a United States hand power bread slicing machine and a brine-cooled cold counter. A large hotel type Edison electric broiler, with metal hood above, and a "Home Comfort" charcoal broiler are furnished for the grill and larder. The bakery is fitted up with two Edison electric bake ovens, two steam proofing ovens, a Read electric dough mixer and other necessary equipment, including a dough trough, marble slab, baker's table, flour rack and sink. The butcher shop, which is located adjacent to the daily service meat refrigerator, is equipped with a Hobart electric foodchopper with meat grinding attachment, and a Sharples electric milk and cream emulsifier, in addition to the usual outfit of meat blocks and cutting tables. The vegetable room has a Hobart electric paring machine, vegetable rack and cutting table, and the bread room is furnished with a hand power bread slicer, bread racks and table. A roll warmer of the Waters-Center Company's "Thermotainer" type is conveniently located in the waiter's passage to the 1st class dining saloon.

The galley and pantry spaces are fully equipped with work tables, dressers and sinks with running hot and cold water. Garbage chutes, flushed with water from the sanitary system, for overboard disposal of waste, are provided in the butcher shop, 1st class galley scullery, glass, silver and china scullery, and beverage pantry, special class galley scullery, cold pantry, and galleys for American and Chinese crew. Steam rice boilers of large capacities are provided in the galleys for Chinese crew and steerage passengers.

Grill service in connection with the 1st class smoking room is provided by a beverage room located just forward of this space and equipped with Duparquet combination electric toaster and griddle, Edison electric combination coffee and hot water urn, Sunkist electric juice extractor, and a Frigidaire electric refrigerator. The special class beverage room is located at the after end of the special class smoking room and is provided with a Frigidaire electric bottle cooler.

The mess pantry in connection with the licensed officers' and engineers' mess-room on the boat deck is electrically equipped with a Duparnuet combination toaster and griddle, an Edison combination coffee and hot water urn, an Edison electric egg boiler, an electric steam table and a Frigidaire electric refrigerator. The officers' mess-room itself is similarly fitted out with an electric egg boiler, combination urn, and steam table. Each of the crew's mess-rooms, for petty officers, seamen and firemen, is equipped with coffee and hot water urns of suitable capacity, and a steam table, and similar urns are also provided in the steward's mess-room, junior engineers' serving pantry, and firemen's lunch.

Built-in refrigerators, each with one to three compartments and all brine-cooled by the ship's cold storage refrigerating system, are provided in the bakery, cold pantry, 1st class and special class beverage pantries, and crew's serving pantry on the main deck.

Small portable ice boxes, made by the Main Manufacturing Company and cooled with ice from the ship's ice-making plant, are furnished for the steerage canteen and the mess-rooms for licensed and petty officers, seamen and firemen.

All steam tables, dressers, working tables, sinks and built-in refrigerators were made by the N.N.S. & D.D. Company in their own shops.

Buff quarry tile, with surface raised in small squares, is laid on cement in the 1st class and special class galley and pantry spaces on upper deck and in galleys for 3rd class and steerage passengers and American and Chinese crew.

Note: In addition to the other galley equipment previously described, a Paracoil clean steam generator supplied by the Davis Engineering Company is installed in the 1st class galley scullery to provide clean steam for cooking purposes.

Fire Protection System

FIRE ALARMS.—All passenger quarters, linen lockers, adjoining store-rooms and similar spaces subject to fires are protected by the Walter Kidde Company's "Selex" thermostatic fire alarm system, with automatic electric supervision, arranged to indicate and give an alarm bell signal in the wheel-house of the presence of fire in any section of the ship so protected. A fire alarm bell is also provided in the engine room. In public spaces and crew's quarters, manual fire alarm stations are provided for turning in an alarm to the central fire detecting station in the wheel-house.

Fire-detecting System.—The Rich system for fire detection is installed in all cargo holds, including those which are refrigerated, in accordance with the requirements of the United States Steamboat Inspection Service Rules. The detecting conduit lines are 3/4" galvanized pipe, led to a detecting cabinet in the wheel-house. System furnished by Walter Kidde Company.

Fire-extinguishing System for Boiler Rooms.—The Walter Kidde Company's "Lux" CO₂ fire-extinguishing system is installed in the boiler room with distributing pipes below the floor plates and with two hose stations suitably located for fighting fires above the boiler room floor. The distributing system under the boiler room floor is controlled from the engine room near the access door to boiler rooms. The system- is of sufficient capacity for properly flooding the under floor space of either boiler room and for supplying the hose stations for a reasonable period without recharging.

STEAM SMOTHERING SYSTEM.—Steam smothering pipes, 1½ diameter, are led from the distributing manifolds in the engine and boiler rooms or on deck to near the bottom of each cargo space and to store-rooms, paint, oil and lamp rooms, in accordance with the requirements of the U.S. Steamboat Inspection Service Rules.

Hand Fire-Extinguishers.—In accordance with the requirements of the United States Steamboat Inspection Service Rules (72) 2½ gallon soda acid type hand fire extinguishers are installed on wall brackets in the various deck spaces, and 6 2½ gallon foam type hand fire extinguishers are provided, two in the boiler rooms, two in the fuel oil filling stations, and two near the gasoline storage tanks on the boat deck. In addition to the above, the usual outfit of fire hose, buckets and axes is provided as required by the inspection rules.

FIRE-Screen Bulkheads and Doors.—For the purpose of preventing fire from working fore and aft in the passenger accommodations, light steel re-screen bulkheads, provided with hinged metal fire-proof doors, are fitted at intervals as required by the London Convention for Safety of Life at Sea.

The fire-screen doors opening out of the 1st class dining saloon are built with a hollow sheet steel frame glazed with clear fire-resisting plate glass, and enameled to match the finish of the adjoining space. The fire-screen doors opening out of the lobbies on the promenade deck are built with hollow sheet brass frame and panels insulated with sheet asbestos between brass plates, and have brass decorative grille on lobby side. Door frames are finished by the application of a layer of metallic brass sprayed on at welding heat, and later rubbed to the desired texture and lacquered. Grilles are of similar design to those fitted in adjoining passage and elevator doors and are of rolled brass with cast brass ornamentation. Fire-screen doors elsewhere are of the usual type, of light steel plate with angle bar frame, and fitted with forged steel hinges and fastenings.

German Shipbuilding for the Far East

Banahaw were ordered from the F. Schichau G.m.b.H., Elbing, by the Philippine Government on June 23, 1930, and were completed by the Danzig yard of this firm in the short time of about eight months. The engines for these vessels were built by Schichau's engineering works at Elbing.

The ships are intended for the service of the lighthouses in the Philippine Islands. They may also be used as fire fighting and salvage ships and have a fresh water capacity to supply fresh water for outlying ports in case of an emergency arising. Besides they are capable of transporting 150 laborers or other workmen and eight passengers in four cabins.

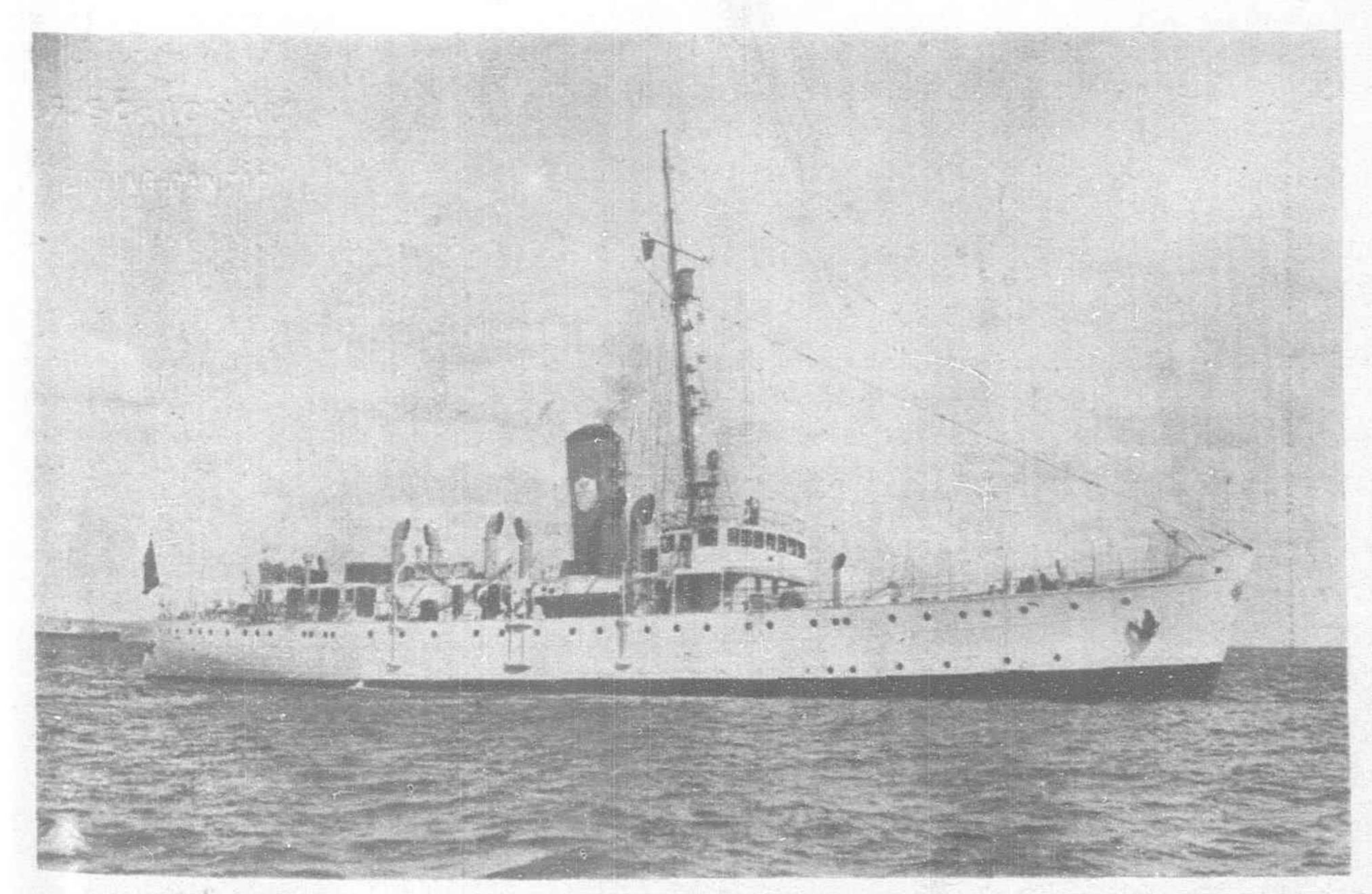
For all these purposes they are equipped in a suitable manner and have seaworthiness and stability to withstand the intense storms in the waters, for which they are destined.

The principal dimensions are as follows:

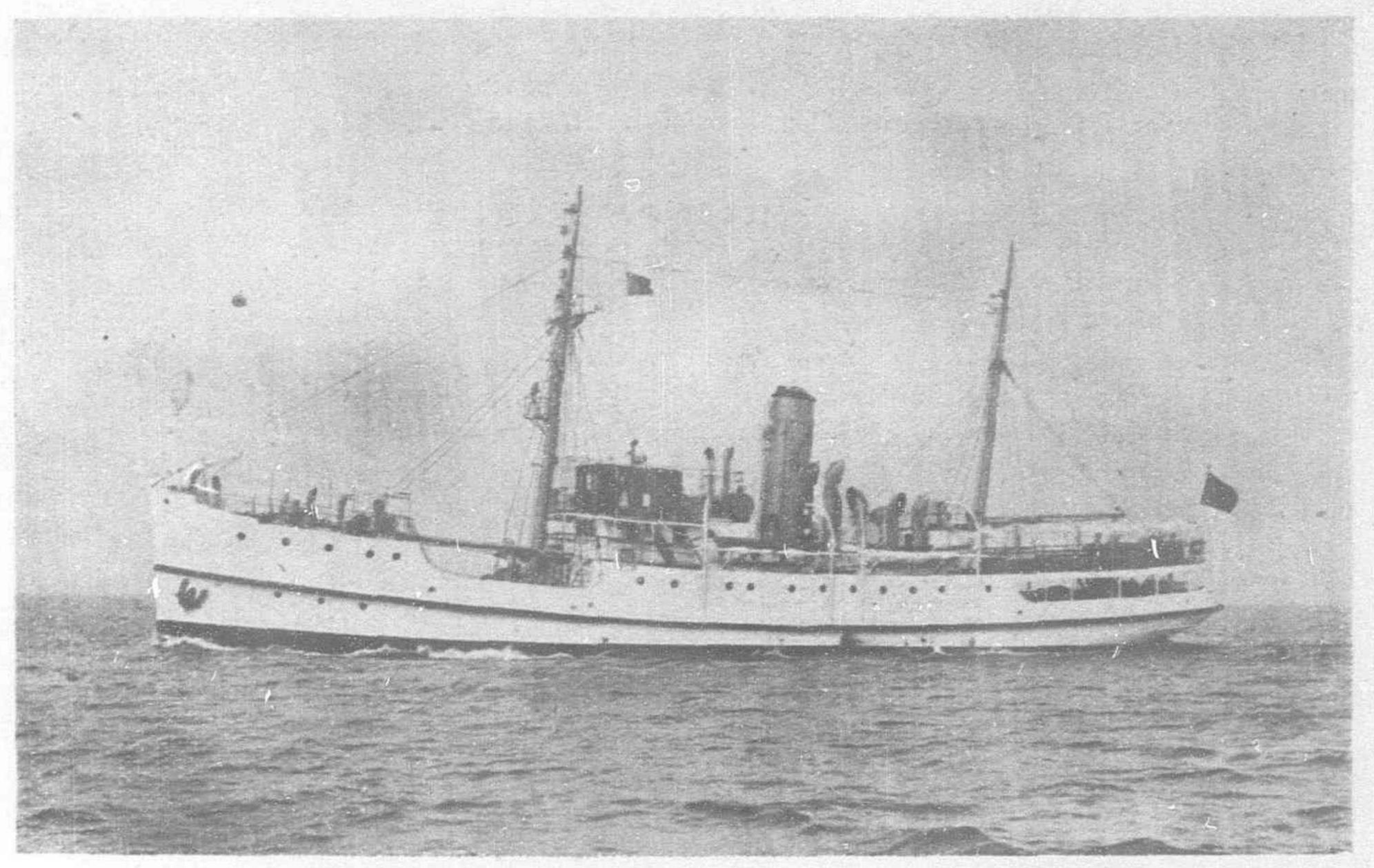
1 1				
Length over all	***	***		$56.557 \text{ m} = 185' 7\frac{1}{2}''$
Length between perpend				52.577 m = 172' 6''
Breadth moulded				9.144 m = 30' 0''
Depth to main deck		***		$4.572 \mathrm{m} = 15' 0''$
Summer draught in seaw			* * *	4.293 m = 14' 1''
Deadweight capacity on	this drau	ight ab	out	750 tons
Gross tonnage				667
Net tonnage				226

The ships and engines are built in accordance with the "Rules for Building and Classing Steel Vessels" of the American Bureau of Shipping for the classes 1 A 1 E and A M S of this Society. They have a forecastle and a large bridge-house, the bridge-deck being extended to the stern to give a well covered space for the deck passengers. The hull is divided by seven watertight or oiltight bulkheads into eight compartments.

In the fore part of the vessels there is a hold of 12,500 cb. ft. bales capacity, intended for the stowage of buoys. For handling the buoys there are provided two derricks of five tons lifting capacity on the fore-mast and two steam-winches of five tons lifting capacity. The after hold has a bales capacity of 5,900 cb.ft. and is handled



The Customs Cutter "Arayat" also built in Germany for the Philippines Government by the firm of F. Schichau



Lighthouse Tender "Canlaon," one of the two twin sister ships built for the Philippines Government by F. Schichau of Elbing.

by a derrick on the main-mast and a steam winch of three tons capacity.

The fuel oil is stowed in three cross bunkers and in a double bottom compartment, the total capacity being 196 tons including settling tanks. This fuel capacity gives the ships a cruising radius of about 4,000 miles so that they may be able to do two months service away from their base without being refuelled and to visit all lighthouses and make the necessary repairs.

For repairing purposes the ships have a large machine tool shop arranged in the bridge house and well equipped with one lathe, one drilling machine, one milling machine, one shaping machine, one grinder. A trolley track with chain hoist is provided for to take heavier pieces from deck into the shop.

The fresh water carrying capacity is 27 tons of boiler feed water, 63 tons of ship's service water and 30 tons of drinking water. As the ballast tanks are cross connected to the fresh water mains, they may also be used for carrying 107 additional tons of fresh water. Besides, the ships are equipped with a distilling plant of ten tons

For fire fighting purposes there are installed on the deck of the wheelhouse and the radio room one fire monitor each. They are connected to the fire and bilge pump of 30 tons/h capacity and cross connected to the salvage and ballast pump of 100 tons/h

and the auxiliary feed pump of 12 tons/h capacity. Besides, the ships are equipped with a continuous foam fire extinguishing chemical plant.

The salvage pump has outboard pumping arrangements with 100 feet of heavy suction hoses of 6-in. diameter for use as a salvage ship. For assistance in salvage and fire fighting work the ships have installed a Zeiss searchlight of about 20 inch diameter.

The firemen are accommodated in the fore 'tween-deck, the sailors in the forecastle, where also is provided a cabin for the boatswain, carpenter, cook and cook's helper. The cabins for the officers and engineers and four twoberthed cabins for eight passengers are arranged in the bridge-house, also the dining room for officers and passengers. It may be remarked, that the passenger cabins can be rearranged to allow more room for only four passengers. The captain and the radio operator are berthed on the bridge-deck. Radio installation is not furnished by the contractor on account of the difficulty of having spare parts and accessories always available in the home port. For the trip to Manila for one of the vessels rented a small set.

The galley is equipped with two oil fired ranges sufficient for the crew and 150 laborers on deck. For keeping provisions the ships have two cold storage boxes of about 350 cb. ft. for meat and vegetables, cooled by a N H₃ refrigerating plant located in a gas tight space in the after part of the engine room.

The boat outfit comprises one 22-ft. motorboat, two 22-ft. life-boats, one 22-ft. cargo-boat and eight life-rafts. The boats are furnished with all necessary equipment. Besides the ships have

on board four life buoys and 208 life preservers.

The engine plant consists of a triple expansion-engine 15-in. by $24\frac{3}{8}$ -in. by $39\frac{3}{8}$ -in. bore and $27\frac{5}{8}$ -in. stroke, developing normally 1,000 i.h.p. at about 200 revolutions per minute, the maximal output being 1,100 i.h.p. at 213 revolutions per minute. The steam is generated in a single ended cylindrical boiler 15-ft. 4-in. in diameter and 14-ft. 6-in. in length with a heating surface of 2,583 sq. ft. and a working pressure of 200 lb. per sq. in. The boiler is furnished with oil burning appliance of Schichau's latest design, Howden's forced draught and smoke tube superheater of the Schmidt-system, the superheating being 700 degrees Fahrenheit.

For electric generating two turbo-dynamos of 15 kw. each

are installed.

The ships' main engines and auxiliaries were submitted to exhaustive tests and trials under the supervision of the Special Representative of the Philippine Government with satisfactory results. Sea trials were run on the bay of Danzig between Naufahrwasser and Hela. The maximal speed was found to be about 12.5 knots, the engine developping 1,100 i.h.p. at 213 revolutions per minute. The fuel consumption was recorded as 1.06 lb. per i.h.p. an hour.

After completion of the trials the vessels were preliminarily accepted by the special representative of the Philippine Government and after having loaded tubes and other goods, they left

the harbor of Danzig on April 3 for Manila.

There are yet under construction for the Philippine Government by the Schichau G.m.b.H. a customs cutter of about 197 feet in length and a speed of 16 knots and a suction dredger of about 10,600 cb. ft. per hour capacity.

The trial trips of the customs cutter Arayat took place early in July in the bay of Danzig to the entire satisfaction of the special representative of the Philippine Government. The guaranteed values were fully attained, and even surpassed

especially regarding speed.

Three New Engineering Projects

(Continued from page 568)

The beating engines are of the Hollander type and include

the latest and most improved design.

The paper making machine is a single cylinder machine capable of making a maximum web of 132-in. wide untrimmed for trimming to 120-in.

The power plant will consist of a 500-h.p. horizontal compound steam engine with a Worthington surface condensing plant, one I.G.E. generator and a complete set of I.G.E. motors for all individual electric drive machines.

Steam will be supplied by one boiler unit consisting of a Heine type (vertical bent tube) water tube boiler.

The buildings and power plant have been specially designed

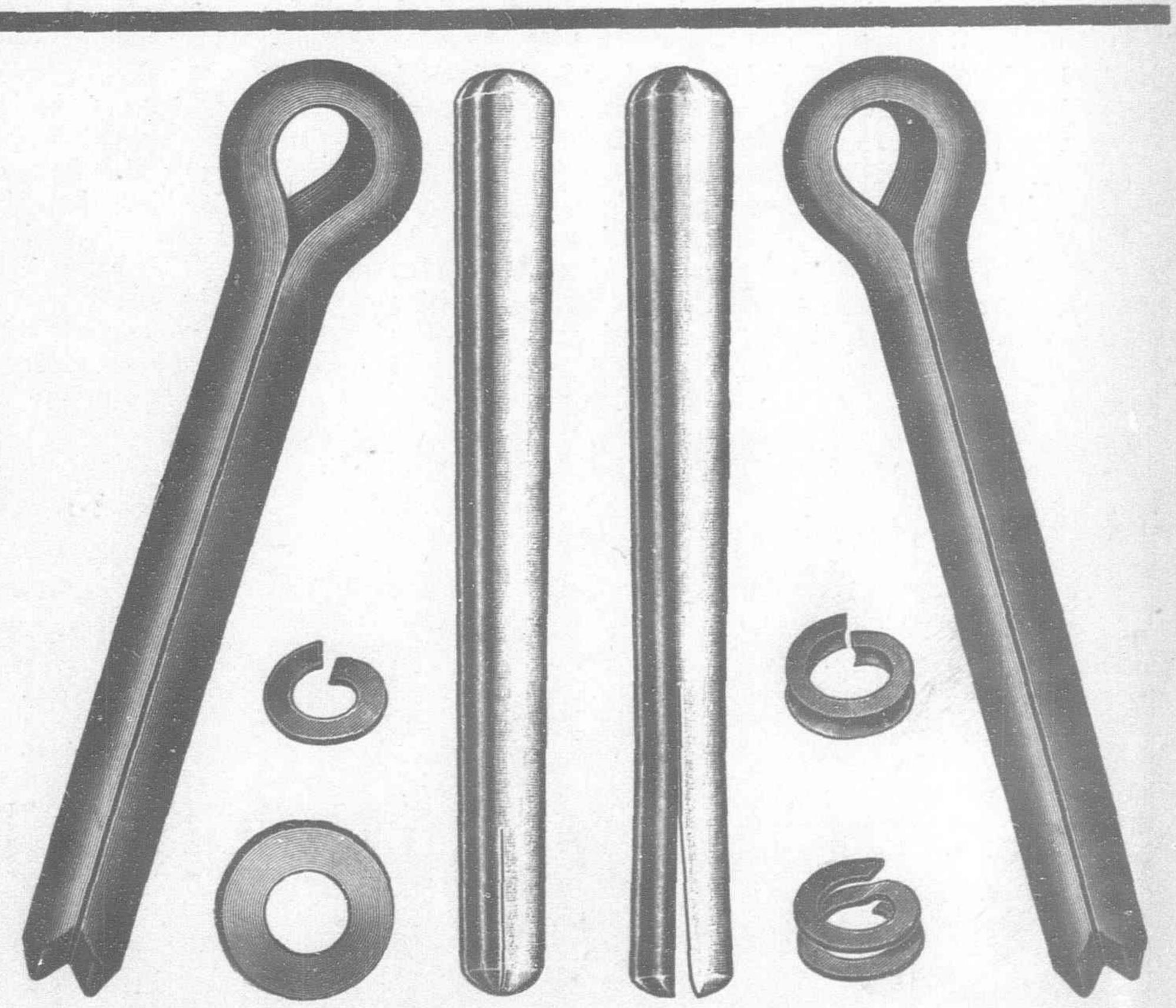
by the engineering staff of Andersen, Meyer & Co., Ltd.

Complete delivery of the whole plant will be made within nive months from date of signing the contract, or about May, 1932.

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